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PUBLIC HEALTH ADMINISTRATION IN TOLEDO.

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The following report gives the results of studies of health organization and administration in the city of Toledo, Ohio. The study was made at the request of the State Board of Health, the City Board of Health, and the Toledo Commerce Club. It was carried on for a period of four months and includes investigations in both the office and the field.

Toledo is a prosperous community with a population of 184,126 and is situated on both sides of the Maumee River at its mouth. This river empties into Maumee Bay, an arm of Lake Erie, and is of sufficient depth in the vicinity of Toledo to permit of the passage of the large lake freighters. Toledo is, therefore, an important lake port as well as an important railroad center.

Among its industries of magnitude may be mentioned automobile factories, plate glass, cut glass, and machine bottle-blowing works, smelters, foundries, flour milling, a beet-sugar mill, oil refineries, and other industries too numerous to mention.

For assistance and information received during the course of this study acknowledgment is made to the officials of the board of health especially to Mr. Sam F. Smith, clerk to the board; to the officials of the department of service and the medical inspector in charge of the health supervision of schools; to the officials of the different charitable organizations; to the secretary of the commerce club and the members of the sanitary committee of that club, especially the chairman, Dr. C. D. Selby, whose interest in public health affairs, fund of knowledge of the subject, and affiliations made his cooperation particularly valuable.

ADMINISTRATION AND ORGANIZATION.

The city health organization is under the administration of a board of health which appoints a health officer as its executive officer. The board, together with its powers and duties, is provided for by statute.

Membership of the board.—The board of health consists of five members appointed by the mayor. No special qualifications are necessary. The mayor by virtue of his office is president, but the board

is authorized to elect a president pro tempore to act in the absence of the mayor.

Term of office of members.—Members of the board are appointed for a term of five years, a term expiring and a new member being appointed each year.

Meetings of the board.—The board meets regularly once a month and as much oftener as is necessary to transact business. Provision is made for special meetings at the call of the president, or of three of its members.

Salary and expenses of members.—Members of the board receive no salary.

Powers and duties.—The board of health is given the authority by statute to promulgate regulations for its own government and for the control of disease and the betterment of the public health. Regulations intended for the general public when “adopted, advertised, recorded, and certified” as are ordinances of municipalities, must be recognized by the courts as having the same force as ordinances adopted by the council. For violation of any such regulation there is provided a fine of not to exceed \$100 or imprisonment not to exceed 90 days, or both.

The board must appoint a health officer, but no special qualifications for the position are specified in the statute.

The board may appoint a clerk to have general charge of the records and reports and the proceedings of the board.

With the consent of the council the board may also appoint “ward physicians” and as many persons for sanitary duty as may be required. These latter employees have general police powers and are designated “sanitary police.” All appointments are made according to civil service regulations.

The board is given exclusive control over its employees. It may define their duties and fix their salaries, and they serve during the board’s pleasure.

The board is further given authority by statute to employ guards to maintain quarantine; to appoint a local registrar under civil-service regulations; to abate “nuisances”; to regulate the location, construction, and repair of “yards, pens, and stables,” and the use, emptying, and cleaning thereof as well as of water closets, privies, cesspools, sinks, plumbing, drains, etc., or where plumbing and sewerage are feasible and necessary but neglected or “refused” in any building, the board may take the necessary action to require correction or may correct the condition, in which event the cost must be assessed against the property; and to abate all nuisances or correct all conditions detrimental to health or well being, found on school property, by serving notice on the board of education. A

fine is provided for failure to comply with an order, and authority is given to the board of health to employ inspectors of schools and school buildings to maintain sanitary conditions.

The board of health may impose a quarantine on vehicles of common carriers when necessary, and may make rules and regulations to restrict communicable diseases disseminated by persons traveling in such vehicles. It is also empowered to investigate houses or localities in which communicable disease is suspected to exist; to quarantine at home or in a suitable place cases of quarantinable diseases; to placard houses containing certain diseases; to disinfect after communicable diseases; to destroy infected articles or buildings under certain conditions; to provide everything necessary to persons in quarantine, the expense so incurred, except for those measures imposed strictly for the protection of the public health, to be borne by the individual quarantined, if able to pay, and if not, by the municipality; to take measures, supply agents, and afford inducements and facilities for gratuitous vaccination; to close schools and prevent public gatherings during epidemics, threatened epidemics, or when a dangerous communicable disease is unusually prevalent; to maintain health supervision of schools or to cooperate with the school board in maintaining such supervision; to appoint inspectors for maintaining the purity of foods and to carry out the provisions of laws or ordinances relating to foods; to inspect maternity boarding houses and lying-in hospitals; to make to the State the necessary reports relating to morbidity and mortality or any special reports required, and to make to the State board of health and the municipal council an annual report on or before the 15th of January.

On the 1st of January, 1916, a radical change will be made in the organization and the methods of administration of the city government, for a new charter, recently adopted, will go into effect. Under this charter the mayor, vice mayor, and councilmen (one for each ward) are elected and the heads of the departments of the city government (of which there are six) are appointed by the mayor. The division of health is made a subdivision of the department of public welfare and is in charge of a commissioner of health, who is appointed by the director of the department. The qualifications required of the commissioner of health are that he be "a person eligible for admission to practice or in practice as a physician and surgeon under the laws of Ohio."

Under the direction and control of the director of public welfare the commissioner of health is required to enforce the ordinances and laws relating to the public health and is given the powers provided by statute to be exercised in municipalities by health officers.

Personnel.—At present the personnel of the health department, exclusive of the board of health, and their respective salaries, are as follows:

1 health officer (part time).....	\$1,800
1 medical inspector.....	2,000
1 chemist.....	2,000
1 clerk to board of health.....	1,130
1 secretary to health officer.....	1,000
1 sergeant of sanitary police.....	990
16 sanitary police, at \$900.....	14,400
1 dairy and food inspector (a veterinarian).....	1,800
4 food inspectors, at \$1,000.....	4,000
1 milk inspector.....	1,000
1 restaurant inspector.....	1,000
3 child-welfare nurses, at \$900.....	2,700
<hr/> 32	<hr/> 33,820

During the first three months of this study the position of health officer was vacant, but it was filled, April 1, 1915, by the appointment of Dr. D. W. Iford, a former member of the board of health.

Office hours.—The office is open every week day from 7.30 a. m. until 5 p. m. and on Sundays and holidays from 9 a. m. until 12 o'clock noon.

The inspectors and sanitary police work from 8 a. m. until 5 p. m. except on Saturdays, Sundays, and holidays. On Saturdays work stops at noon. There are, however, two of the sanitary police on duty Saturday afternoons, Sundays, and holidays to attend to any emergency work that may arise.

The laboratory is open during the same hours as the office, and any necessary work is performed on Sundays and holidays.

Sufficient time is allowed for lunch. An annual vacation of 2 weeks is granted to each office employee, and 10 days to each member of the field force.

Transportation.—The health department owns and maintains a two-passenger automobile for the use of the chief dairy and food inspector, and one two-horse ambulance, used for conveying smallpox patients to the isolation hospital. The sergeant of the sanitary police acts as driver of this vehicle. The sanitary police, in uniform, travel free on street cars, while other inspectors and nurses are furnished with street-car tickets.

The automobile cost the department \$458.15 and its maintenance for 300 working days amounted to \$295.95, or approximately \$1 per day. This is equivalent to the amount that was previously paid for the use of a horse and buggy. By comparison, however, the automobile is by far the more economical form of transportation because of the much greater amount of work that can be accomplished in a day. Each dairy inspector should be supplied, therefore, with an inexpensive runabout.

Discussion.

It is difficult to believe that the interests of public health will be advanced under the new charter. The board of health, which has independent powers, is abolished and the authority to make regulations is vested in the council. The health officer is made subordinate in the control of the policies and expenditures for the betterment of public health. The division of health is placed on a par, for instance, with the division of cemeteries and the division of playgrounds, whereas if a health organization were permitted to carry on all of its important and legitimate activities, it would form a department of a city government as large as or even larger than any other.

That the framers of the charter apparently had a misconception of the duties of a health department is shown by the fact that the management of municipal hospitals, which includes the isolation hospital and free dispensaries, such as child welfare and antituberculosis dispensaries, is placed not in the health department but in a division of the department of public welfare, known as the division of charities and corrections. The health department should be unhampered in its efforts to control the preventable diseases and therefore the isolation hospital and the child welfare and antituberculosis dispensaries should be directly under the management of the health officer and all officials employed in the work should be under his immediate direction.

Furthermore, it is made a duty of the commissioner of charities and corrections to provide for the study of and research into causes of disease, and, by means of lectures, exhibits and in other proper ways, to promote the education and understanding of the community in those matters which concern the public health and welfare. Certainly research into the cause of disease and education along the lines of public health are among the duties of a health department.

So many important public health functions are placed in the division of charities and corrections that the division of health will virtually become a division for the correction of nuisances.

Fortunately, a wise provision of the charter permits the council to determine, combine, and distribute the functions and duties of divisions, and it is anticipated that this body will take the necessary action to place the duties before mentioned in the health department, where they properly belong.

In the charter no mention is made of the necessary qualifications for the health officer. In consequence the position may be filled on account of political considerations and not because of the ability of the appointee.

The present board of health has authority which, if it had been exercised energetically and wisely, with moral and financial assistance from the council, and the employment of a capable health officer, an

epidemiologist, more nurses and fewer sanitary police, would have resulted in Toledo having to-day a small but efficient health department capable of meeting squarely many of the existing problems in need of solution.

EPIDEMIOLOGICAL ACTIVITIES.

Morbidity Reports.

The requirements relating to the reporting of diseases are based on State law and regulations of the State Board of Health, which at the 1914 October meeting were revised to conform to the provisions of the Model Law for Morbidity Reports.

Methods of procedure.—Physicians have been reporting by telephone cases of the notifiable diseases occurring in their practice. The information thus obtained is entered on a card containing spaces for the date reported, whether a new or recovered case, the name of the disease, address, name of family, and by whom reported. The physician has been required to confirm the telephone report by a written report on a postal card furnished for the purpose by the board of health. This procedure has been frequently neglected by physicians. Heretofore semimonthly summaries of the number of cases of the several diseases reported have been sent to the State Board of Health.

The new regulations require that physicians report immediately cases of the notifiable diseases on a regular form furnished for the purpose. The reports received at the city health department on these forms are transmitted to the State department of health at weekly intervals or oftener, after a transcript has been made for the files of the local health department.

The Control of Disease.

Requirements of law.—In addition to the laws that have already been summarized in connection with the powers and duties of the board of health, a statute relating to the control of rabies is summarized as follows:

A dog which chases, worries, injures, or kills certain animals or persons may be killed, and if while it is running at large a person wounds it only he is exempt from prosecution under the penal laws which punish cruelty to animals. The owner or harbinger of the dog is liable to the person damaged for the injury done.

The court before which the recovery is had for such injury may declare the dog a common nuisance and order it killed.

A person who has been bitten by a rabid animal and it has been necessary for him to employ medical or surgical aid or otherwise to expend money, is entitled to receive reimbursement from the county in an amount not to exceed \$500.

Requirements of ordinances.—In addition to statutes which give to the local board of health certain well-defined powers and duties,

the city council has enacted a few ordinances bearing on the control of disease. Those of any importance are summarized as follows:

Members of the board of health and representatives of the board are given authority at all times to enter any lot, building, stall, vessel, etc., in the discharge of their duties, after the object of their visit has been stated to the person in control of the place.

The board of health has the authority, when it is not expedient to send a case of smallpox, varioloid, cholera, diphtheria, or scarlet fever to a pesthouse, to confine the case in a dwelling and placard the same.

Public funerals of persons who have died of smallpox are prohibited.

Public funerals of persons who have died of scarlet fever, diphtheria, or other dangerous contagious or pestilential disease are prohibited, unless the body is placed in a hermetically sealed casket.

For violation of the above ordinances there is provided a fine of not more than \$50 or less than \$5.

Spitting on the sidewalks or in any theater or other public building or in any street car is prohibited. For violation there is provided a fine of not less than \$1 nor more than \$10 for each offense.

Requirements of regulations.—Regulations of the local board of health prohibit the use of the common towel and common drinking cup in cars, vessels, vehicles, or conveyances operated by common carriers within the State, or in any school, church, hospital, workshop, factory, hotel, etc., etc.

Methods of procedure.—The card on which the report of a case of notifiable disease is noted is placed in a "daily reminder" file until the quarantine of the case, if any, has terminated. The information contained on this card is given to the sanitary policeman from whose district the disease is reported. He investigates and submits a report on a regular form which is in the nature of a very incomplete and inaccurate epidemiological study. The information obtained is not by any means conclusive and the few questions asked are the same for all diseases. It is, in fact, not to be expected that a person with the knowledge and training of the sanitary police would be capable of making the complete epidemiological study necessary to scientifically control any disease. It is also the duty of the sanitary police to placard the house and to disinfect when necessary.

All cases of smallpox and all cases of chicken-pox in adults are seen by the medical inspector. Cases of diphtheria may also be visited by him and cultures taken for diagnosis, provided the attending physician has sent no culture to the laboratory for examination or has examined none in his own laboratory. One negative culture for the release of quarantine is required. No cultures from contacts are taken. The medical inspector also sees those cases of communicable diseases in which a difference of opinion has occurred over the diagnosis.

Certain notices relating to the occurrence of communicable diseases are sent out from the office of the health department. For instance, the school authorities are notified in the case of diphtheria, scarlet fever, measles, and chicken-pox. When library books are found in

the household, the public library is notified in the case of smallpox, diphtheria, and scarlet fever. It is understood that such books may not be returned, but if returned they are destroyed. This applies to school books as well.

Diphtheria, scarlet fever, and smallpox are required to be quarantined, and when such quarantine is imposed, notice is sent to the family in quarantine stating the fact and any privileges that they may be entitled to. This refers especially to breadwinners. The breadwinner in a household under quarantine for diphtheria or scarlet fever may be given permission to carry on his business provided he does not return to the house and that he complies with certain other requirements. If it is deemed advisable, permission is given on a special form to a person to enter quarantined premises to do necessary errands.

When a patient is released from quarantine he receives a card which is authority to return to school or work.

Circulars of information relating to the cause and prevention of typhoid fever, diphtheria, or membranous croup, and scarlet fever, published by the State board of health, are sent by the local board of health to every household in which a case of the disease has been reported.

Disinfection.—Terminal disinfection of the house is practiced after diphtheria, scarlet fever, and smallpox; of the room after measles and chickenpox; and upon request after typhoid fever, tuberculosis, and erysipelas.

The time for disinfection is left to the attending physician and is coincident with the date of finding a negative culture, or with the disappearance of desquamation or scaling.

The disinfectant used is paraformaldehyde contained in a tin box with lamp attachment. The operation is performed by the sanitary police, directions being left with the family to open the house or room after a period of five hours' exposure to the gas.

The isolation hospital.—This hospital is located about a mile beyond the city limits and is under the control of the department of safety.

It is built of brick and contains two wards, each accommodating 16 patients and each with its toilet, bath, separate exit, and a small compartment formerly used for fumigating clothes of patients before departure from the hospital.

A front wing contains six smaller rooms, one of which is used as quarters for the nurse, one as a kitchen, and one as a dining room, three being utilized as private rooms for patients. There has recently been constructed a rear wing, not quite ready for occupancy, which will be used as a kitchen and dining room, thus making avail-

able as a dressing room and a private room the two rooms in the front wing now devoted to kitchen and dining room purposes.

In a separate frame building is a boiler which furnishes steam for heating the hospital and for use in a sterilizer for clothes and bedding. It also furnishes power to operate an electric generator for lighting the buildings.

The radiators in the wards are located in the floor in relation to a fresh air intake, thus furnishing heated fresh air in the rooms.

Water is obtained from an artesian well and supplied to the buildings, under pressure, by means of a gasoline engine and elevated tank.

Smallpox only is treated at the institution.

Diagnostic Laboratory.

The medical inspector is also bacteriologist of the health department. Since February 1 of the present year he has had an increase of salary from \$1,200 to \$2,000 a year and in the future will be expected to devote his entire time during the day to official work.

The laboratory is in one of four rooms occupied by the health department. It is in no way adapted to the purpose, its windows opening on a narrow court, making it necessary to use artificial light at all times, even on days when the sun is shining brightly.

This room is used jointly by the chemist and bacteriologist, whereas it is not any too large for either a chemical or a bacteriological laboratory, and it is inadequately ventilated.

The work done by the bacteriologist consists in the occasional examination of cultures for the diagnosis of diphtheria, the examination of well waters for contamination, examination of milk samples three times a week, and rarely a sputum examination for tuberculosis.

The equipment is probably sufficient for the amount of work performed.

Discussion.

A study of the morbidity and mortality reports filed with the city board of health indicates that there are undoubtedly many cases of notifiable diseases not being reported. In the case of typhoid fever, for instance, there were reported in 1914, 294 cases, with 67 deaths. According to the reports on file, there were six cases brought into the city, all of which ended fatally. Subtracting these from the total cases there would be left 288 cases with 61 deaths, being a case fatality rate of approximately 21 per cent. Such a high percentage of deaths does not actually occur. It is probable that the rate did not differ materially from that of typhoid fever elsewhere, and that in all likelihood about 1,000 cases of the disease occurred in the

city during that year. A careful epidemiological study would have brought to light many unreported cases and have secured other important data necessary for prevention.

The same remarks might be made concerning diphtheria. There were reported during 1914, 312 cases of the disease with 33 deaths, giving a case fatality rate of about 10 per cent. This is too high, and means that there were many unreported cases during that period, or that there was a failure to use, or a delay in the use of, antitoxin. This might be excusable in rural districts, but certainly not in urban communities. It should be stated here that antitoxin is furnished free of charge to indigent cases both as a curative and prophylactic agent. The expense for the same is borne by the county.

In case of measles, there were reported 921 cases with 7 deaths, or 1 death for every 131 cases. This would indicate that there were about twice as many cases of measles occurring as were reported.

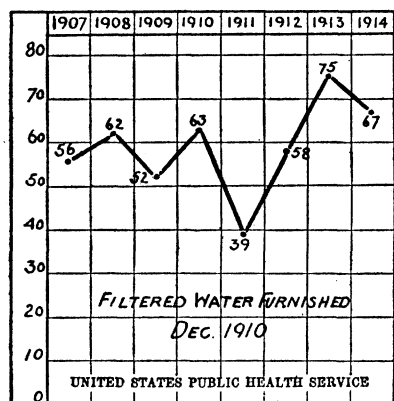


FIG. 1.—Reported deaths by years. Typhoid fever.

tuberculosis were not reported. Many of the reported cases were notified by officials of the Thalian Society. It is evident that many of the practicing physicians of the city are paying too little attention to the requirements in respect to reporting this disease as well as other notifiable diseases

Proper epidemiological studies have not been carried on at any time and the methods pursued for the control of the preventable diseases are on the whole not up to date.

Typhoid fever.—Take, for instance, typhoid fever, a disease which is entirely too prevalent for a city as progressive as Toledo.

In December, 1910, the filter plant was finished and filtered water furnished for domestic purposes. A glance at the accompanying diagrams (Figs. 1 and 2) will show that this procedure had little influence on the incidence of the disease, although during the year immediately following the use of filtered water there were comparatively few deaths from typhoid fever. This, however, seems to have

Of the more familiar notifiable diseases, scarlet fever and smallpox seem to have been best reported, there having been notified 223 cases of scarlet fever with but 2 deaths and 474 cases of smallpox with 1 death. This last case had practically recovered from smallpox, and death was due to a previously existing cardiac trouble.

In 1914 there were also reported 452 cases of tuberculosis with 326 deaths. Obviously, many cases of

been a coincidence, as since that year the previous rate has been maintained, in fact exceeded, there having been 75 deaths in 1913 and 67 in 1914, while previous to filtration the maximum number of deaths per annum since 1905 was 63, in 1910. It might justly be inferred from the above that the city water supply has never been an important factor in the causation of typhoid fever.

Although there never has been attempted any real work for the purpose of tracing the origin of the many different cases of typhoid fever, the charge has been made that the shallow wells (of which there are many in the city) are the cause, and that the disease can never be eradicated until these wells are eliminated. This may be true, but it would perhaps be more consistent to say that the surface well is only one of numerous causes for the continuance of the infection.

Surface wells are bad mainly because of their insanitary environment. The map shows the location of the reported cases of typhoid fever for 1914. In a general way the cases of typhoid fever are grouped in two large areas of the city, where many surface wells are also found. It must be pointed out, however, that in these sections the

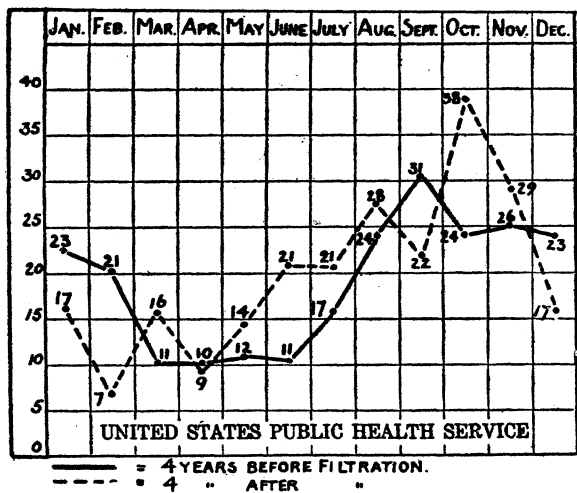


FIG. 2.—Reported deaths from typhoid fever 4 years before and 4 years after filtration.

sanitary conditions are generally bad, the insanitary privy is common, and the population not the most enlightened in public health matters.

The epidemiological records of typhoid fever give information on but four points of any importance, namely, the name and address of patient, the name of the milk dealer furnishing milk to the house where the patient is confined, and the source of the water supply used in that house. No history of the case, from the epidemiologic standpoint, is obtained by the health department during the important period of the disease—that is, the 15 days preceding the onset of symptoms. Such records as exist would appear to emphasize the fact that, while shallow wells are a factor, there are other factors of greater prominence contributing to the continuance of the disease in the city. Based on analogy with other cities and inspections of the several areas of the city, it can be assumed that there are many conditions present to account for the spread of typhoid fever.



Figure 3 shows the deaths from typhoid fever by months for 10-year period 1905-1915. It will be seen that from January to April there is a decline in the deaths from typhoid fever, but that from May on there is a steady rise, which reaches its height in October—that is, as the weather becomes warmer and flies increase in numbers the deaths from typhoid fever also increase, to decline only upon the appearance of cold weather. There is, however, no month in the year in which the city does not have an inordinately high death rate from the disease.

Now, if the fly be given the opportunity to come in contact with excreta from a case of typhoid fever there exists a very common means of spreading the disease. This state of affairs exists in Toledo, for at a certain season of the year flies are numerous there, and there are many surface privies, especially in the two areas where typhoid fever seems most prevalent.

Special emphasis must be laid on the view that direct contact may play a large part in the continuation of the disease. Practically no effort is made to supervise the carrying out of prophylactic measures, either in this or any of the other communicable diseases, except,

perhaps, smallpox, and there should be a well-organized corps of visiting nurses for this purpose. The nurses of the District Nurse Association, an organization supported by private philanthropy, take care of a good many patients suffering from typhoid fever as part of their routine work, but they do not see them all. In fact, there are a large number that no one sees, and until prophylactic measures can be taken in all cases little progress will be made. For this reason it is most important that an epidemiologist discover every unrecognized, concealed, or unreported case and determine the source of the infection in each case, whether it be from water, milk, flies, contact, or

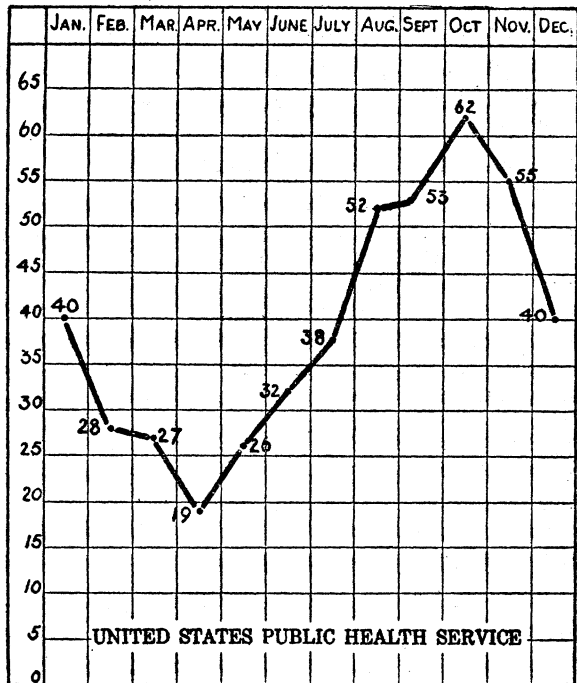


FIG. 3.—Typhoid fever.—Reported deaths by months—8 years, 1907-1915.

imported into the city. It would seem advisable or even necessary to take certain steps, immediately, to eradicate the disease. These should include the employment of trained epidemiologists and competent nurses; the closure of all surface privies and the requirement that all houses connect with the sewer and with the city water supply; the eradication of all fly-breeding centers by proper collection and disposal of manure or garbage, together with an active fly-swatting campaign; the issuance of prophylactic packages free of charge by the health department as well as furnishing free of charge antityphoid vaccine; and the elimination of surface wells because they are liable to become contaminated, and have no place in urban communities which have gone to the expense of furnishing pure water supplies under pressure. The sewers and water mains should be made available to all the people without delay. In addition, the milk supply of the city should be pasteurized under official supervision.

Smallpox and vaccination.—This subject is covered by both statutes and ordinances, which are summarized as follows:

Requirements of law.—The board of health may take measures and supply agents and afford inducements and facilities for gratuitous vaccination.

The board of education may make and enforce rules and regulations to secure the vaccination of and prevent the spread of smallpox among the pupils attending or eligible to attend the schools of the district. The board of health upon the application of the board of education must provide, at public expense, the means of vaccination.

Requirements of ordinances.—It is the duty of all parents or guardians to have minors under their control promptly, frequently and effectively vaccinated, so that they may not take, or be liable to take, smallpox. Such vaccination must be performed free of charge to those unable to pay. The admission of a pupil to any public or private school is prohibited unless such pupil has been vaccinated within the preceding five years or has had smallpox.

Every pupil must present a certificate of vaccination from a physician, or other satisfactory proof that the ordinance has been complied with.

The last two ordinances presumably should be enforced by the local board of education, but actually little or no attention is and has been paid to them. The attorney general for the State has ruled that when smallpox is "unduly prevalent" the board of health may require compulsory vaccination of school children.

During the year 1913 there were 310 cases and in 1914, 474 cases of smallpox reported to the board of health.

Certain persons opposed to vaccination wished to limit the action of the board of health to the imposition of the quarantine of contacts for 17 days after disinfection, instead of vaccination of contacts with quarantine as an alternative in case vaccination was refused, and argued that this procedure was required by law.

This view was upheld by the city solicitor, who ruled that according to the statute quarantine must be imposed, and the health officer had no discretion in the matter. This is obviously wrong, as the law uses

the expression "where other inmates of such house [where a patient is undergoing quarantine] have been exposed to and are liable to become ill of any such disease [they must be quarantined], for a period thereafter counting from the completion of disinfection, as follows: * * * in smallpox, 17 days; * * *." It is clear that although a person be exposed to smallpox he may not be liable to become ill—as, for instance, if he be vaccinated, in which case quarantine is not mandatory. The legal opinion resulted in the city having to go to the unnecessary expense of employing guards to maintain the quarantine of contacts, as well as of furnishing food to contacts, an expense amounting to about \$14,298.47.

The modern method of combating outbreaks of smallpox is to isolate the patient and to vaccinate the contacts, or to quarantine contacts in lieu of vaccination.

Tuberculosis.—The antituberculosis work is performed by the Thalian Society, and will therefore be discussed later under that heading.

Diphtheria and scarlet fever.—Diphtheria also has not been handled in a scientific manner. No epidemiological studies have been made, and it is only recently that the laboratory has been utilized to determine the period of release from quarantine. No effort is made to detect carriers among the contacts in the home or the school.

The State law provides that in case of diphtheria the house must be placarded and quarantined and that nobody may leave without the written permission of the board of health, and that inmates exposed to infection and liable to become ill must be quarantined for a period of 14 days after disinfection. This period of detention would seem to be mandatory only when contacts are liable to become ill. Whether they may or may not be so liable would be logically left to the discretion of the board of health, which should base its decision upon cultural findings.

In practice it has been customary to hold the patient and all contacts who are children the full 14 days, and until recently no throat and nose cultures have been taken from patient or contacts. The time for disinfection has been determined wholly upon the statement of the attending physician.

The time for disinfection in scarlet fever is based upon the termination of desquamation and is fixed by the attending physician. The board of health has made it a rule, however, never to disinfect earlier than 10 days from the date on which the house was placarded. Health officers now agree that every case of common communicable disease has its origin in a previously existing case or an apparently healthy person harboring the causative organism. In order to prevent the spread of disease therefore the case or carrier must

be isolated, thus removing the focus of infection and the isolation hospital becomes one of the most important features of a health department.

The isolation hospital in Toledo, now being used for smallpox only, should be enlarged so that cases of diphtheria, scarlet fever, typhoid fever, and measles could be properly isolated. Additional buildings are needed to isolate all open cases of tuberculosis for it is only by compulsory isolation that any marked reduction will be made in the number of cases and deaths from this disease. An isolation hospital as contemplated above should have not less than 400 beds.

In order to make the laboratory of utility to the health department and the community, its scope should be enlarged, better quarters and equipment should be furnished and a bacteriologist employed to devote his entire time to the work.

Opportunities should be offered to the physicians to have Widal tests and blood cultures made, to have sputum examined and Wasserman reactions determined, and to have other laboratory work performed to facilitate the early diagnosis of communicable diseases. Two negative release cultures from the nose and throat of diphtheria patients should be required, closer check should be kept on the bacterial content of the milk supply, and more samples from surface wells should be examined. Facilities should also be provided for carrying on original investigations into the causes of diseases and health problems of interest to the locality.

When practicing physicians are assured that material sent to the laboratory will be examined promptly and accurately, they will no doubt, in the interests of their patients, avail themselves of the opportunities offered.

It has been suggested that the University of Toledo, which is in the position to raise the necessary funds, establish a laboratory which may be used in common by the board of health and the university. This university is a young, enterprising institution, supported by the municipality. The suggestion would seem to be a good one, as it would obviate the necessity of duplicating equipment and space and would by cooperation make available to the university the practical laboratory workers of the health department for teaching purposes. However, it must be pointed out with special emphasis, if such an arrangement should be agreed upon, that the chemist and the bacteriologist doing health-department work must be absolutely under the control of the health officer and should receive their pay from the health department. A division of authority is not conducive to efficient work.

Tabulation of regulations for the control of the common communicable diseases as enforced in Toledo, Ohio.

Disease.	Period of quarantine patient and contacts.	Placarding.	Terminal disinfection.	Treatment of breadwinners.	Excluded from school and public gatherings.
Diphtheria (membranous croup).	After 1 negative culture.	Yes.....	Yes; of house..	May be permitted to carry on occupation.	Yes; patient and contacts.
Scarlet fever.....	10 days after disinfection.	Yes.....	Yes; of house..	Same.....	Same.
Smallpox.....	17 days after disinfection. Patient is usually isolated in the isolation hospital.	Yes.....	Yes; of house..	Same.....	Same.
Measles.....	Patient and children until desquamation has ceased.	Yes.....	Yes; of room..	.....	Same.
Chicken-pox.....	.....do.....	Yes.....	Yes; of room..	.....	Same.
Typhoid fever.....	No quarantine.	No.....	Upon request.	.....	Patient only.
Whooping cough..	For patient only until recovery.	Yes.....	No.....	.....	Patient only.
Tuberculosis.....	No quarantine.	No.....	Upon request.	.....	May be excluded.

Disease.	Notice of quarantine sent to family.	Public library notified.	Circulars of information.	To be reported by physician.	Disposal of dead bodies.	Remarks.
Diphtheria (membranous croup).	Yes.....	Yes.....	Yes.....	Yes.....	Within 24 hours. No public funeral.	One culture taken for release. None from contacts.
Scarlet fever.....	Yes.....	Yes.....	Yes.....	Yes.....	Same.....	Disinfection after disappearance of desquamation.
Smallpox.....	Yes.....	Yes.....	No.....	Yes.....	Same.....	Disinfection after all scabs have disappeared. Contacts may be released upon successful vaccination.
Measles.....	Yes.....	No.....	No.....	Yes.....	Same.....	Disinfection after scaling has ceased.
Chicken-pox.....	Yes.....	No.....	No.....	Yes.....	No children are permitted to attend funeral.	Chicken-pox in adults seen by medical inspector.
Typhoid fever.....	No.....	No.....	Yes.....	Yes.....	No restriction.....	No supervision by board of health.
Whooping cough..	No.....	No.....	No.....	Yes.....	.....do.....	Recovery based on disappearance of whoop.
Tuberculosis.....	No.....	No.....	No.....	Yes.....	.....do.....	No supervision by board of health.

The determination as to when the place is ready for disinfection is left mainly to the attending physician.

MUNICIPAL ENGINEERING ACTIVITIES.

Under this heading will be considered the subjects of sewage disposal, water supply, disposal of garbage and rubbish, and street cleaning. These activities are so intimately concerned with the public health, and therefore with public health engineering, that they might logically be carried on in a division of engineering of a well-organized health department. In Toledo, however, they have become a function of the department of service.

Disposal of Sewage.

The sewers of Toledo empty their contents into three streams, namely, the Maumee River, Ten Mile Creek, and Swan Creek. Ten Mile Creek empties into Maumee Bay, while Swan Creek has its outlet into the Maumee River. The two creeks receive about 50 per cent of Toledo's sewage, or about 9,800,000 gallons daily. It is certain that they are too small to receive this amount of sewage without thereby creating a nuisance. In fact, they become at low-water periods merely open sewers, and it would be advisable to discontinue their use as channels for conveying waste products.

The highest sewer outlet of any magnitude discharging into the Maumee River is located about $3\frac{1}{2}$ miles below the intake of the water supply. Between this sewer outlet and the intake are several smaller sewers, including one carrying waste products from the water purification plant. It is said that under certain conditions of wind the water in the river will back up, thus carrying some of the city's sewage to the intake. The purification plant, however, even in such emergencies, seems to be well able to take care of the situation as far as the public health is concerned.

Anticipating the undesirable, or even dangerous, situation that may eventually occur if the present method of sewerage disposal continues, the State board of health has devised a system of intercepting sewers for conveying the sewage from Toledo, Maumee, and Perrysburg, the two latter being small towns located on the river just above Toledo. Included in this plan is a sewage purification plant, which will undoubtedly be necessary.

Sewerage system.—There are at present in the city 260.47 miles of sewers. Except in certain outlying districts and a few instances in the more congested residential portions, the city is fairly well laid with both main and lateral sewers.

A statement to the effect that most of the buildings in the city have sewer connections while in a way correct, would, nevertheless, be very misleading. It is true that all new buildings are provided with modern plumbing fixtures properly connected to the sewer, but the system in use in many of the older houses in the less pretentious residential districts is such that the good results to be expected from sewer connections are nullified by serious defects in the system itself.

The diagram (fig. 4) explains this system better than words. It will be noted that the cesspool or "catch basin," as it is called locally, is a poor imitation of an uncovered septic tank. Built over the opening is a poorly constructed privy, permitting free access of flies to the fecal matter below. One side of the cesspool is connected to the sewer. Into the other side empties the house drain, which does not carry sewage, but which is connected with the cellar and the overflow

from the cistern and the slop sink located outside of the house, the idea being that an accumulation of water in the cellar, an excess of water in the cistern, and all waste water will, on its way to the sewer, flow through the cesspool and thus act as a flush.

Often the outlet of the cesspool becomes plugged, the cesspool fills up, its contents back up into the house drain and cellar, and by reason of poorly laid drain pipes, even into the well which is frequently in close proximity or in juxtaposition.

These cesspools are supposed to be water-tight to a level somewhat above the intake and outlet. Perhaps they are. The danger, however, lies mainly in the fecal matter being exposed to flies, and this menace is present whether the cesspool be full or operating normally. If full, there is the added danger of overflow, with surface contamination.

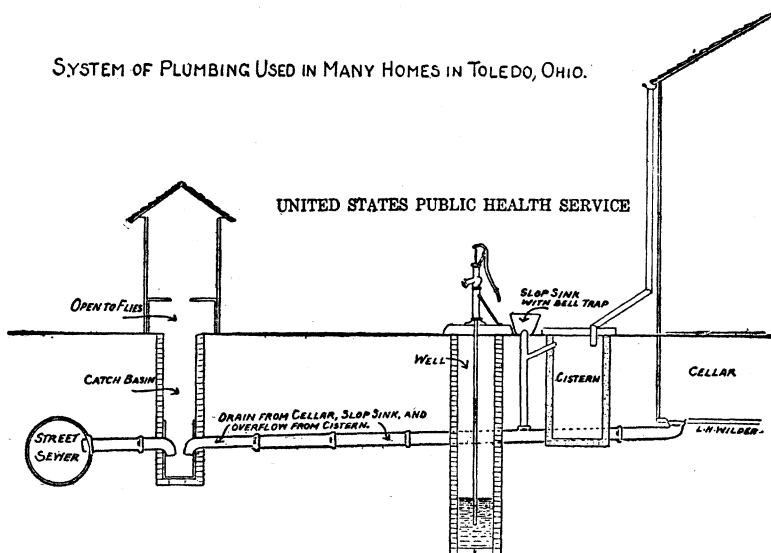


FIG. 4.

Plumbing.—The ordinances relating to plumbing are contained in the building code and enforced by the department of safety. They do not differ materially in their provisions from those adopted by other cities and as usual are so voluminous and restrictive that modern plumbing, instead of being recognized as a necessity, has become a luxury.

The officials who are interested in having human waste matter disposed of in a sanitary manner, aided and encouraged by the individuals whose business it is to install systems for such disposal, have gradually succeeded by complicated legislation in defeating the very purpose for which the enactment was intended, namely, to give to all, rich and poor alike, a clean, safe, and modern means of conveying certain waste products from the house to the street sewer.

To a certain extent the original conception of a system of modern plumbing was based on false premises; that is, that sewer gas is responsible for many ills. It is now known that sewer gas can not cause or transmit disease.

The standards that have been established are unnecessarily rigid. It has been assumed that to install a plumbing system that would prevent the spread of disease requires particularly fine workmanship, a worker of unusual ability, and materials of exceptional quality. This has been the cause of bringing about a combination of circumstances making a modern plumbing system practically prohibitive to the person in poor financial condition.

In Toledo the need for modern plumbing in many houses is imperative. The cesspool must be abolished; in fact, State law and regulation and a city ordinance prohibit them, but because of the

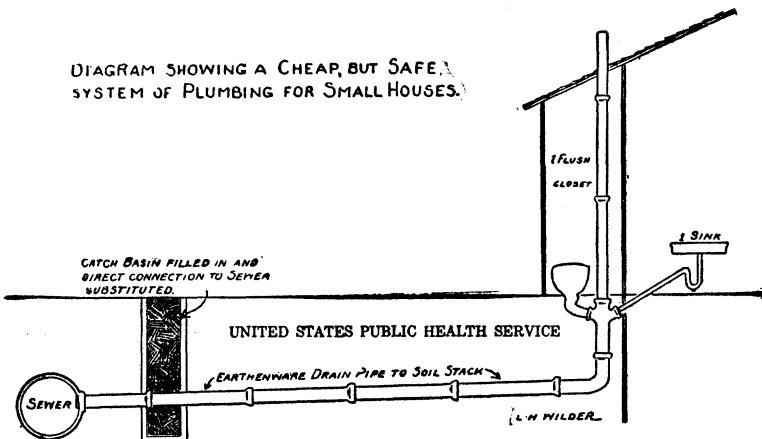


FIG. 5.

cost of the installation of fixtures, sewer pipes, traps, back venting, sewer connections, and the like the board of health has refrained from taking any drastic action. Such action, however, should be taken immediately, and when the householder refuses to obey the orders of the board the work should be performed by the city and the cost charged as a lien against the property. At the same time, the plumbing ordinances should be modified, making it possible to install a simple but efficient system of plumbing at reasonable cost.

Fig. 5 shows a simplified system of plumbing for small houses which will insure an adequate and safe means of carrying sewage from the house to the street sewer. It is contemplated to use standard soil pipe, a deep seal trap at sink, no brass ferrules on flanges, no back venting, earthenware pipe to soil stack, galvanized iron flashing, etc., with the idea of decreasing the cost without lessening the utility of the installation.

The Water Supply.

The municipal water supply is taken from the Maumee River about $3\frac{1}{2}$ miles above the first large sewer outlet. This river begins in the vicinity of Fort Wayne, Ind., and flows through Ohio, emptying into Lake Erie. Along its banks are located a number of prosperous communities, the largest of which are Fort Wayne at its origin and Toledo at its termination. It is therefore receiving pollution along its entire course and accumulates much organic matter and silt.

On account of the prevalence of typhoid fever in the city and the muddy condition of the drinking water it was decided to build a filtration plant. This was finished and in operation in December, 1910. Since that time the city water has been of undoubted purity as far as it affects the health of the community, and yet no effect has been had on the typhoid death rate.

The purification plant is comprised of mechanical filters supplemented by hypochlorite treatment and a pumping station operated by gas engines using producer gas.

The water is pumped from the intake to the head house or inlet well where it is mixed with alum in a proportion averaging 4.4 grains of alum to the gallon of water. The amount of alum used varies from time to time, depending upon the turbidity of the water. Thus, in April, with an average turbidity of 501 and with suspended matter averaging 201 parts per million, there was used an average of 7 grains of alum to the gallon of raw water. On the other hand, in September, with an average turbidity of 91 and 31 parts of suspended matter per million, there was used an average of but 2.8 grains of alum per gallon of raw water.

From the inlet well the water passes by gravity to the sedimentation basins, two in number, having a capacity of 5,000,000 gallons each. By an arrangement of mixing baffles the water and coagulant are thoroughly mixed and a baffle wall directs the flow from one end of the basin to the other and back before passing to the filter beds. This represents a distance of 1,000 feet and takes about 6 hours in the passage, or a sufficient time for precipitation and sedimentation to take place. These settling basins are cleaned once every month. During the year 1914, 4,033,640 pounds of mud were removed.

The filter conforms to the type of rapid sand filters. It is composed of 34 units each having a normal capacity of 1,000,000 gallons per day or a maximum capacity consistent with efficiency of one and one-third million gallons. Each unit has an area of 360 square feet. The filtering material consists of 30 inches of sand and 9 inches of gravel in 4 sizes. Each unit will operate about 60 hours before cleansing is necessary. It is then cleaned by reversing the flow of water under pressure, at the same time forcing air through from below upwards,

thus agitating the sand particles to permit of more thorough washing. The units can be cleaned rapidly.

The filtered water is treated with calcium hypochlorite in varying quantities, depending upon the amount of organic matter and color index. The average daily amount for the year 1914 was 20 pounds per million gallons, with a maximum of 25 pounds per million and a minimum of 12 pounds per million. The excessive amounts are said to be necessary because of the large quantity of organic matter and high color index. After treatment the coloration is reduced about 50 per cent.

There is a chemist in charge of the plant who keeps close check, chemical and bacteriological, on all of the operations, and determines daily the amount of chemicals necessary and the efficiency obtained.

Each day 0.01, 0.1, 1, 5, and 10 cubic centimeters of a sample of the raw water are placed in fermentation tubes of lactose broth and lactose bile. The same is done with a sample of the filtered water, except that the amounts are 0.1, 1, 5, 10, 25, and 50 cubic centimeters. The presumptive test only is taken as an indication of the presence of colon bacilli. The results of examinations of 359 samples of raw and 360 samples of filtered water during the year 1914 were as follows:

RAW WATER (359 SAMPLES).

0.01 c. c.		0.1 c. c.		1 c. c.		5 c. c.		10 c. c.		25 c. c.		50 c. c.	
+	-	+	-	+	-	+	-	+	-	+	-	+	-
23	336	182	177	308	51	359	0	359	0	.....	.....	.....	.....
0%	.....	50%	.....	86%	.....	100%	.....	100%	.....	.....	.....	.....	.....

FILTERED WATER (360 SAMPLES).

0	360	0	360	0	360	0	360	0	360	41	319	86	274
0%	.....	0%	.....	0%	.....	0%	.....	0%	.....	12%	.....	24%	.....

Of the samples of filtered water showing the positive presumptive test in 25 cubic centimeter amounts, all were collected during the first six months of the year. During the last six months none was positive.

In addition to the daily tests for colon bacilli, bacterial counts of the raw, settled, and the filtered water are made three times a day at intervals of eight hours. The average counts by months are shown below.

1914.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Raw water.....	10,535	13,070	21,711	18,672	11,600	2,308	2,850	1,382	1,270	2,880	2,943	2,264
Settled water.....	427	770	1,078	137	344	134	405	219	307	480	324	20
Filtered water.....	145	164	274	36	96	87	87	18	8	8	21	12
Percentage of efficiency.....	98.6	98.7	98.7	99.9	99.1	96.2	96.9	98.7	99.3	99.7	99.3	99.4

The large number of bacteria in the filtered water during January, February, and March, as compared to the number present during the other months of the year is to be accounted for by the fact that in January an inadequate amount of hypochlorite was used, while in February and March that chemical was not used at all.

After filtration and treatment with hypochlorite the water passes by gravity to a pumping station where it is pumped directly into the mains. On account of the low elevation of Toledo and the surrounding country it is not possible to utilize a pressure gravity system, and there are therefore no distributing reservoirs. There are, however, two storage reservoirs, one of 5,000,000 gallons and one of 16,000,000 gallons capacity, which are kept filled by the excess of water filtered over that used by the city. These reservoirs furnish a reserve supply.

During the year 1914 there were filtered 6,931,920,000 gallons of water, of which approximately $1\frac{1}{2}$ per cent was used as wash water, and the rest, amounting to 6,791,196,000 gallons, was delivered to the city. This means a daily average of 18,606,016 gallons, or approximately 100 gallons per capita per day. It should be noted that the filter plant is not being worked to its normal capacity, for it would be able under normal conditions to furnish 100 gallons per capita per day to 340,000 people. Thus it has been designed to care for a future growth of the city.

The objectionable feature of the city water is its hardness, this averaging 260 parts per million for the year 1914 both in the raw and the treated water. Much of the hardness is due to the bicarbonates of calcium and magnesium, so that when the water is heated carbon dioxide is liberated and for a short time after being drawn from the tap the water has a milky appearance. The carbon dioxide causes more or less destructive action on galvanized-iron water pipes and hot-water tanks. The hardness is also due to the incrustants, calcium and magnesium sulphate. Because of its hardness a change in the chemical treatment of the water has been contemplated, substituting calcium oxide and ferrous sulphate for the alum. This should greatly reduce the hardness and make the water more agreeable for washing purposes. Hypochlorite will still be used, but it may be possible with the proposed change to use it in smaller quantities.

There are in use in the city a number of driven wells about 200 feet deep. These probably furnish an uncontaminated water. On the other hand, the shallow wells and cisterns, of which there are many in use in the city, because of their poor construction and insanitary environment are liable to pollution and are out of place in a progressive municipality which has gone to the expense of furnishing to its citizens a safe potable water under pressure. That the city water is hard can not be denied, but this might be remedied by a change in the treatment. That the water has at times a bad odor is equally true, but this should be easily prevented by some modification in the operation of the plant. Bad odors do not cause disease.

Collection of Garbage and Rubbish and Street Cleaning.

Requirements of ordinances.—The ordinances bearing on the subject of garbage collection and disposal are summarized as follows:

Every resident householder, tenant, hotel keeper, boarding-house keeper, wholesale and retail dealer and vender of meats, fish and fowls, fruits and vegetables, and every person occupying a dwelling in the city must provide a garbage receptacle. Such receptacle must be a portable vessel or tank of not more than 2 bushels capacity, perfectly water-tight, and provided with a tightly fitting cover which must not be removed except when necessary in the use of the receptacle. It must be placed at the rear of the house or in the basement areas or passageway most accessible for purposes of collection, but must not be placed on a street, alley, sidewalk, or other public place.

By the term garbage or offal is meant refuse accumulation of animal, fruit, or vegetable matter, liquid or otherwise, that attends the preparation, dressing, use, cooking, dealing in or storage of meats, fish, fowls, fruits, or vegetables. It is unlawful to place in garbage receptacles any refuse except garbage and offal.

The city may remove garbage or may contract to have it done. This also applies to the removal of carcasses of dead animals. No one but an authorized person may collect or transport garbage and it is unlawful for any person to dispose of any garbage except as provided for by the above ordinances.

It is unlawful to throw garbage or anything that may cause an obstruction into any catch basin, sewer, ditch, or drain, or to throw, bury, burn, or leave garbage in or upon any street, alley, vacant lot, public square, etc.

For violation of any of the provisions of the garbage ordinances there is provided a fine of not less than \$5 nor more than \$50.

Requirements of regulations.—The regulations bearing on the subject of garbage are summarized as follows:

Every resident must have a galvanized iron garbage can of not less than 10 gallons capacity, with two side handles and a close-fitting cover.

This can must be kept in the back yard near the alley fence, and must be used for nothing but pure garbage.

Where there is no alley the can must be placed at or near the back door of the house. The collector will not go indoors, upstairs, or down cellar, to empty or to return the can.

The garbage must be drained of water before being thrown into the can. This is a sanitary measure, but it also saves the resident money in winter, as it prevents the garbage freezing to the side of the can at the cost of being chopped out and the can ruined.

The can should be scalded once a week, and should be replaced as soon as it is found to be leaking.

The collector is not required to remove the garbage if he finds anything else in the can. Paper, tin cans, and all other refuse and rubbish of whatever kind must be kept in a separate receptacle.

No money or other remuneration may be given to the collector. He is paid by the city.

All complaints must be made to the street department and all dead animals must be reported to the same office. They will immediately be removed by the dead animal collector.

The street department is required to collect garbage in the residence district once a week, from large flats twice a week, and from hotels and restaurants every day.

Collection and disposal of garbage.—Garbage is collected by the city and disposed of by means of reduction. The city owns the horses and wagons and employs the men engaged in the work of collection.

Collections are made in the business section of the city from hotels and restaurants once a day, from residence districts once a week, and from flats twice a week.

In collecting garbage from hotels and restaurants the full cans are removed and empty cans which have been flushed with water substituted. From other places the contents of the can only are removed. They are first emptied into a tin basket carried by the scavengers, and then into the wagon, a procedure which goes a long way toward preserving the shape and usefulness of the garbage can.

Three types of wagons are in use. One is a truck designed to carry 12 large garbage cans. Another type has a rectangular, removable iron body with a capacity of about $2\frac{1}{2}$ tons. This is closed by a canvas cover. Another type has a horizontally placed cylindrical, removable iron body also with a capacity of $2\frac{1}{2}$ tons. One driver and a helper accompanies each wagon. Garbage wagons and teams, of which there are 28, are used exclusively for collecting garbage.

In addition to these wagons a motor truck is used capable of transporting the bodies of two wagons containing 5 tons of garbage.

To expedite the removal of garbage to the disposal plant, when the hauls are too long to permit of two trips a day per wagon, a collection station has been established at a convenient place near the business section of the city. Here the loaded bodies of the wagons are removed from the running gears by a hoisting apparatus and placed on the auto truck or on platforms awaiting such means of transportation.

The disposal plant is a commercial enterprise owned by a private company which receives from the city \$489.58 per month. Garbage must be delivered to the plant by the city. A description of the process used at the reduction plant is briefly as follows:

The body of the wagon is removed by a hoist and its contents are dumped into a cement pit. Running in a channel along the bottom of the pit is a conveyor into which the garbage is raked. As it passes along, a man removes the tin cans or other rubbish, and it is finally conveyed to iron retorts where steam is applied to effect reduction. After this process is completed the reduced garbage is subjected to pressure which forces out the excess of water and some grease. It is then taken to drying ovens where the remainder of the water is expelled by heat. The offensive gases given off during the process are condensed or burned in order to prevent a nuisance. The dried material is then placed in a specially constructed percolator where it is given three treatments with gasoline. The percolate containing the dissolved grease obtained after the first and second application of the menstruum, is distilled. The gasoline passes off to be condensed and used again. The residue is the grease which is a final product of the plant. This product should represent about 3.3 per cent by weight of the total amount of garbage treated. The gasoline

used in the third application contains the least amount of grease and is utilized before distillation as the first application in a new charge.

The tankage from which the final trace of gasoline has been expelled by heat is then perfectly dry and is drawn off, ground, and sieved, and forms the other final product of the plant. It is used in the manufacture of fertilizer. The disposal plant, according to report, has not been making money. Apparently it has been permitted to run down so that it was not possible to operate it on an economical basis and much of the grease was lost. The plant is at present being repaired and some new apparatus installed. When completed it should insure a profit on the investment.

Collection of ashes.—Ashes and other rubbish are collected only two or three times a year so that during the winter there accumulates in the alleys, unpaved streets, and lots a large collection of ashes notwithstanding an ordinance prohibiting the throwing of rubbish of this kind in such places. In the collection of rubbish it is customary to use hired wagons and teams in addition to the rubbish wagons owned by the city. It would be desirable to inaugurate a more frequent collection of rubbish instead of the present system.

Street cleaning.—Street cleaning is accomplished by means of 8 sprinkling wagons, 8 flushing wagons, 6 sweepers, and the necessary employees, including a force of "white wings" working in the business section of the city.

The flushing wagons are not operated by a gasoline pump, but are charged with air under a pressure of 70 pounds before leaving the sheds for the day's work. This serves throughout an entire working period. Flushing is usually done at night.

Housing and equipment.—The building which houses the equipment necessary to carry on the activities of the department of service contains stables for the horses and a horseshoeing shop, shops for rebuilding or repairing wagons or other rolling stock, offices, store-rooms, stock rooms, and yard space and sheds for the wagons. The property is well taken care of and the property responsibility placed in a businesslike way. Discipline among the employees seemed to be well maintained, and the horses well cared for and in good condition. The entire plant was well ordered and in a sanitary condition.

The following tabulation will indicate the activities carried on, together with the expenses incurred during the year 1914:

Garbage:

Loads collected.....	10, 507	
Tons collected.....	26, 267	
Pay roll, labor.....		\$48, 331. 28
Incidentals, repairs, etc.....		2, 833. 34
Disposal plant.....		5, 874. 96
Garbage road repairs.....		1, 995. 94
New equipment.....		11, 660. 74
		<hr/> \$70, 696. 26

Street cleaning:

Alleys and rubbish, loads collected.....	21, 103
Streets, loads collected.....	18, 310
Snow, loads collected.....	9, 701
Sweeping streets, miles.....	612
Flushing streets, miles.....	340
"White wings," sweeping by hand, unknown.	
Pay roll, labor.....	\$78, 786. 57
Rigs, equipment and supplies.....	12, 981. 83
Alleys and rubbish.....	17, 726. 52

Dead animals collected:

Dogs.....	2, 909
Cats.....	1, 107
Other animals.....	126

4, 142

Pay roll, collector.....	720. 00
Rigs, oil and repairs.....	413. 15

1, 133. 15

Comfort stations (2):

Pay roll.....	3, 106. 36
Supplies.....	1, 243. 36
Repairs.....	131. 58

4, 4 1. 30

Street repairs:

Total amount repaired.....yards..	20, 081
Total cost.....	19, 526. 24

Asphalt repairs:

Total amount laid.....yards..	10, 961
Total cost.....	9, 324. 10

Stone roads:

Built and repaired.....yards..	12, 795
Total cost.....	4, 222. 35

Oiling roads: Total amount..... 643. 38

Sewers: Total cost of cleaning and maintaining..... 14, 240. 21

Other activities in connection with maintenance and repairs to pumps for artesian wells, Cherry Street Bridge, steam roller, turnpiking and grading, crosswalks, blacksmith shop, and street opening..... 22, 525. 77

Supervision, office expenses, etc..... 13, 461. 80

Moving and remodeling building, machinery, etc..... 6, 634. 00

Not including the expense for new equipment, it cost the city to collect 1 ton of garbage and deliver it to the reduction plant approximately \$2.02 or \$5.05 per wagonload of 2½ tons.

To dispose of 1 ton of garbage at the reduction plant cost the city 22½ cents.

Total cost of collection and disposal, \$2.24½ per ton.

Discussion.—If a sanitarian visiting Toledo should attempt to gain from the citizens an idea of the system of garbage collection he would very likely conclude there was none. Upon personal investigation he would be agreeably surprised, therefore, to learn that the city was actively engaged in garbage collection and that the system was probably as efficient as possible, taking into consideration the number of wagons and the nature of the employment.

A health department and a garbage division are in the unfortunate position of having to listen to many complaints but rarely a word of commendation. Sometimes the complaints are well founded, sometimes they are not. Not infrequently they arise from a lack of cooperation on the part of the citizen, either the complainant or his neighbor.

During the year 1914 there were collected about 26,267 tons of garbage or approximately 72 tons per day. The garbage is very wet, it being estimated that the excess of water amounts at times to as high as 20 per cent. In the summer this can be drained off into the house drain before emptying into the wagon, but in the winter it is frozen and has to be taken with the garbage.

Householders should realize that it is not to their interest to throw water into the garbage can, which causes rapid rusting, and if frozen renders the can liable to injury from the picks used by the scavengers.

It is thought that in Toledo a conservative estimate of the amount of waste products from kitchens or other similar sources would be one-half ton for every 1,000 people or about 90 tons or 20 per cent more than is being collected. The bulk of this uncollected garbage is probably to be found in the outlying parts of the city or is comprised in part of the garbage incinerated on private premises.

Except in the down-town districts the intervals between collections are certainly too long, especially during summer weather. In order to shorten them it would be necessary to increase the number of wagons, and probably it would be better to adopt a type of wagon that could be used both for garbage and ashes. It would be well to collect ashes twice a week and garbage four times a week in summer and twice a week in winter, in addition to the present daily collection from the hotels and restaurants. The entire city should be covered and collections made regularly. Steam or electric cars might be used for conveying garbage to the reduction plant, thus shortening the hauls made by wagons. Householders should be required to provide two containers, one for garbage and one for rubbish.

By reason of the bad odors produced at times, the reduction plant has been the cause of many complaints. However, the installation of washers for the gases and a gas-consuming furnace and a careful supervision over the operations of the plant make it possible to reduce the nuisance to a minimum, especially where the garbage furnished is fresh and the capacity of the plant is not overtaxed. The plant is designed to reduce 90 tons of garbage a day. A more frequent collection would result in delivering garbage in the fresh condition, and the amount delivered would be more equally divided so that overtaxing the plant's capacity would be less likely to occur.

FOOD INSPECTION.

Food inspection as carried on by the health department of Toledo will be taken up under three headings, namely, "The Control of the Milk Supply," "The Inspection of Meats and Other Foods," and the "Chemical Laboratory."

The Control of the Milk Supply.

By statute, the control of the milk supply in municipalities in Ohio is placed in the hands of the local boards of health. The State law also makes provision for the maintenance of the purity of the milk. In addition to law the city of Toledo has passed ordinances requiring certain precautions to be taken.

Requirements of laws.—The laws are summarized as follows:

The board of health may appoint, define the duties and fix salaries of, inspectors of dairies, slaughterhouses, etc., milk, meat, etc., who are given the right of entry into any house, vehicle, or yard. The board may authorize the health officer to perform the duties of such inspectors.

The board of health is required to keep a record of the name, address of residence and place of business of all persons engaged or about to engage in the sale of milk, and may issue a permit, after inspection, to sell milk. If the place is found in an insanitary condition the permit may be refused. The board may also require a certificate from a licensed veterinarian that the cows furnishing milk brought for sale within the city are free from tuberculosis or other dangerous disease.

If typhoid fever, scarlet fever, or other dangerous contagious or infectious disease occurs in the family or among the employees of the producers or venders of milk, the dairyman or vender must immediately notify the local health officer, who may order the sale of such milk stopped pending an investigation. The investigation must be made without delay and the board of health may order such steps to be taken as will prevent the sale of impure, adulterated, and unwholesome milk or milk liable to carry disease.

All dairies, including the cows, cow stables, milk houses and vessels, the owners of which offer milk, butter, or cheese for sale within the city are subject to inspection. The inspectors may enter any place where milk is sold or kept for sale and any vehicle used for the conveyance of milk within the corporate limits.

When an inspector believes that milk found in the city is impure or adulterated, he must take specimens and subject them to satisfactory tests, and, if the board of health directs, to chemical analysis. A record must be made of the results of the test and the analysis. A certificate sworn to by the analyst must be admitted as evidence in prosecution.

Milk is deemed adulterated if it contains more than 88 per cent of watery fluid or less than 12 per cent of solids or less than 3 per cent of fats.

For selling adulterated milk or milk to which a foreign substance has been added, or milk taken from diseased cows or cows fed on distillery or starch waste, or from cows kept in an insanitary place, there is provided a fine of not less than \$50 nor more than \$200 for the first offense, and not less than \$100 nor more than \$300 or imprisonment in the jail or workhouse for not less than 30 days nor more than 60 days for the second offense.

Further penalties are provided for misrepresentation as to pure milk: For the sale of skimmed milk unless properly labeled; for selling or manufacturing condensed

milk not up to the State standard, or if made from skimmed, impure, adulterated, or unwholesome milk; for selling milk which is impure, unclean, unhealthy, or unwholesome, or milk falsely labeled or branded; for keeping a cow for the production of milk in a cramped or unhealthy condition or feeding it on food which produces impure, unhealthy, or unwholesome milk; for filling or refilling milk or cream bottles without previous cleansing or sterilization.

Requirements of ordinances.—No person may sell milk or cream without a permit from the board of health. The application for a permit must be made on proper form and must contain the following information: Name, and address of residence and place of business. The dealer must thereafter notify the board of health of any change in the location of his business. The permit is issued after an inspection has shown that the stables, cows, wagons, store, and utensils are clean; that the food furnished to the cows is pure and wholesome; and that the persons handling the milk are clean and free from disease. The application must be signed by the applicant and filed in the health office and a record kept of same. The board of health may revoke the permit for cause. If applicants or persons from whom applicants receive milk refuse permission to have their dairies or herds examined the board of health may refuse a permit. The health officer or other person designated by the board of health has the right to enter and inspect all places where milk is sold.

If dairy herds are located in Lucas County the milk inspector has the right to inspect them for the purpose of detecting the presence or absence of tuberculosis or other infectious disease. If the herds are located outside of Lucas County such examination may be made by some local person satisfactory to the board of health. The health officer or inspector is authorized to use the tuberculin test and report without delay the results to the board. All animals examined must be tagged so as to show the presence or absence of disease.

All cans containing milk or cream coming into the city must be sealed before shipment. Inspectors have the authority to open any cans or other vessels sealed or otherwise, and if the milk is found to be filthy or the cans unclean the milk or cream may be then and there condemned and poured upon the ground. A record must be kept of all milk destroyed, with a record of the analysis of the sample taken before condemnation. Also a record must be kept of all inspections made. The board of health has the right to take samples of milk or cream for analysis, not exceeding in amount 1 pint. All wagons must have painted on both sides, in letters not less than 5 inches high, the name of the vender and the permit number. Wagons selling skimmed milk must be so labeled, and all wagons from which skimmed milk is sold and all receptacles containing skimmed milk must be painted pale blue. All premises from which milk is sold must be kept clean and free from garbage and rubbish.

No person suffering from an infectious disease such as cholera, smallpox, whooping cough, typhoid fever, typhus fever, scarlet fever, or consumption, or having come in contact with such diseases is permitted to handle milk, nor can milk be sold from any place where such disease is present without a permit from the board of health.

Cows suffering from an infectious disease must be removed from the herd, and milk from such cows must not be sold. It is unlawful to sell any milk from which a whole or part of the cream is removed, except as skimmed milk. Whole milk must contain not less than 3 per cent of butter fats, 12 per cent of total solids, solids, nonfat, 9 per cent, and not more than 88 per cent of water. Cream must have not less than 18 per cent of butter fats.

Milk must not be sold if it is drawn from cows within 15 days before and 12 days after parturition, if it contains any preservative, or if it comes from diseased cows or cows fed on refuse from vinegar factories or other similar material, and persons are forbidden to have in their possession for the purpose of feeding to milch cows any refuse from a distillery or vinegar factory or other similar slops. The same applies to cream.

All milk must be properly aerated immediately after milking, and must be kept free from dirt, foreign material, and sediment. All milk after aeration and straining and when offered for sale must be at a temperature of 60° or under.

When offered for sale milk must not contain more than 500,000 bacteria per cubic centimeter, and must contain no pathogenic organisms.

No milk or cream can be sold in quantities of less than 1 gallon, except in sanitary bottles sealed with a suitable cap or stopper, and except where the milk is sold at the milk house or dairy, when it may be dipped. Such dipped milk must not be carried on any street except in a covered vessel.

No person is permitted to transfer milk from one receptacle to another on a street, alley, or on any wagon, vehicle, or in any exposed place. Milk may be so transferred only in a creamery, milk depot, or in the house of the customer.

The name of the dealer bottling the milk or cream must be indelibly and legibly indicated on the cover or cap of the bottle. For violation of the above ordinances relating to aeration, temperature, etc., there is provided a fine of not less than \$25 nor more than \$300, or imprisonment in the workhouse not to exceed six months, or both.

Methods of operation.—There are two men engaged in the supervision of the milk supply. One, a graduate veterinarian, inspects producing farms and pasteurizing and bottling plants. In addition to this he is required to inspect, before and after slaughter, all animals killed in the local slaughterhouses except those under United States Government supervision, and to examine and supervise the disposition of dogs suspected of having rabies. It is needless to point out that these duties are too many for one inspector, and inspections of farms and milk plants are necessarily limited to infrequent intervals. The other inspector devotes his time to the collection of samples.

Samples are mainly collected in the early morning from wagons, twice a week for bacteriological and three times a week for chemical examination. An unopened pint bottle is taken as a sample. It is sealed by the inspector and the data necessary for identification written on the seal. The seal is of paper and is pasted over the top and around the neck of the bottle. Samples for bacteriological examination are iced during warm weather. No samples of bulk milk are taken, but an inspection of the cans at the depots is occasionally made to determine whether they are sealed according to ordinance. If cans arrive unsealed they are tagged and returned to the shipper.

The board of health does not recognize any standard except that already mentioned. There is, however, one producing farm which, by arrangements with the local physicians, furnishes certified milk which sells for 12½ cents a quart. This farm is in Michigan and was not inspected by the author. A visit was made to other producing farms in close proximity to Toledo. The results of these inspections were very disappointing. The barns were poorly ventilated and, generally speaking, dirty. The small-top milk pail was

not used. The cows were mostly dirty, aëraters were not protected from flies, and, in fact, indications were that the farmers were lacking in the progressive spirit. Producing farms are scored once a year.

There are several plants furnishing pasteurized milk, and with one exception all use the holding method. There is, however, no uniformity as to temperature or time of holding, the temperature varying from 140 to 150 degrees and the time from 15 to 30 minutes, depending on the ideas of the person operating the plant. No thermoregulator or temperature recorder was in use at any of the plants, although it is understood that a temperature recorder has been installed at one plant since the inspection was made. The milk is always bottled by machinery, but capping, in many instances, is accomplished by hand.

Several plants were using a method for pasteurization which if operated properly should give excellent results. The raw milk is received, heated, held, cooled, agitated, and to some extent aërated in the same tank, from which it passes direct to the bottling machine. The fewer pipes and exposed surfaces the milk comes in contact with after pasteurization the less chance of contamination. The process is carried out by means of a revolving pipe or disk coil through which passes first the hot water and then water cooled by brine.

One of the plants uses paper bottles, which is a step in the right direction, but these bottles are not entirely satisfactory. The bottle is square, with a circular opening cut in its top for the mouth. It is made of thin pasteboard and is opaque. At the milk plant it is shaped into the proper form by four machines from blanks furnished by the manufacturer and finally parafined inside and out by a special apparatus. The cap is also furnished by the manufacturer, and when the bottle is filled the cap is placed in the opening by hand and then expanded by a piece of special machinery, thus making a tight stopper. A square paper bottle has many advantages over glass, both to the dealer and to the consumer, in that it is used but once and therefore is in no danger of contamination, and the annoyance of collecting bottles and breakage are avoided. It can also be packed in a smaller space and, being square, the bottles can be placed in close apposition, thus conserving a low temperature for a longer period of time. The kind mentioned, however, is not entirely satisfactory.

A study of the laboratory records giving the results of bacteriological examination of bottled raw milk taken from the delivery wagon shows that previous to August, 1912, but a small percentage of samples gave counts of less than 100,000 bacteria. About August, however, the regulations relating to cooling and bottling were put into effect. From August, 1912, to May, 1913, a majority of samples had a bacterial content of less than 100,000 per cubic centimeter.

After this date, however, the number of samples having over 100,000 bacteria per cubic centimeter greatly increased, some months being as high as 100 per cent, although the average remains below the standard of 500,000. Judging from the results of the analysis of bottled pasteurized milk collected under the same conditions, it has also increased in bacterial content until in many instances it is far from satisfactory. One could reasonably infer that the supervision over the milk supply has recently been less severe and that the methods used in handling the milk have therefore become lax. It should be stated, however, that recently the pasteurizing plants have installed the holding system, whereas previously they had used the flash method, therefore they should now produce a better quality of pasteurized milk.

The bacterial counts were made on agar, the strength and reaction of which was unknown, and the plates kept at room temperatures for periods varying from 24 to 72 hours. The time elapsing between the hour of collection and the hour of plating also varied considerably, as the bacteriologist, on account of his manifold duties, was not always able to plate promptly. In interpreting results, it is therefore necessary to make due allowance for faulty technique.

During the months of June, July, August, and September, 1914, an examination of 107 samples of milk for colon bacilli gave negative results.

The chemical examination of the milk supply during the last three years shows a steady improvement in the amount of chemical constituents, few samples at present being below the standard in butter-fat content. It would, however, be poor milk, indeed, that could not show 3 per cent of this ingredient.

The chief dairy and food inspector estimates that there are consumed daily in the city of Toledo 10,500 gallons of milk and 500 gallons of cream and that 90 per cent of this supply comes from Michigan and only 10 per cent from Ohio.

During the year 1914 there were brought two prosecutions for selling adulterated milk and one for refusing to take out a permit to sell milk. A conviction was obtained in each case.

Discussion.—It is evident that there should be employed a full-time bacteriologist who should immediately make a complete and scientific study of the milk supply, including bacterial counts and the presence of streptococci and leucocytes. Samples should be collected from the producing farms and milk depots, from pasteurizing plants just before and just after pasteurization, and from the delivery wagons. As near as possible these samples should be taken from the same consignment in order to determine the rate of increase in the number of bacteria through its different stages of production and transportation and the efficiency of the methods employed for

pasteurization, etc. In that way faults could be discovered and methods instituted for their correction.

The general principle should be accepted that in order to be sold raw milk must come from tuberculin-tested cows or must be pasteurized. So far as known the health department has made no effort to determine the presence of tubercle bacilli in the market milk of Toledo, but I am informed by the analyst of one pasteurizing plant that 17 per cent of the samples before pasteurization inoculated into guinea pigs produced tuberculosis. It should be the duty of the health department to carry on these investigations.

On account of the difficulty and expense experienced in the enforcement of a state-wide law requiring all milch cows to be tuberculin tested and the fact that contaminated milk is frequently responsible for outbreaks of typhoid fever, scarlet fever, and diphtheria, a wise regulation would be one requiring all market milk to be pasteurized except perhaps that coming from the certified farm, provided the standards set by the certified milk commission were lived up to.

A standard should be set for pasteurized milk, by which is meant that each plant should be required to install a thermoregulator and a temperature recorder, and that milk should be heated to 145 degrees for 30 minutes. Uniform heating should be insured by a properly constructed pasteurizer.

It is important that more inspectors be employed for the inspection of milk producing farms. Such men need not be veterinarians, but they should be intelligent, that they may secure the cooperation of the farmers and by educational means improve the conditions. One of the food inspectors and one of the best fitted of the sanitary policemen should be detailed for this purpose.

If raw milk continues to be sold, the cows from which it comes should be tuberculin tested and a higher bacteriological standard set. The maximum number of bacilli should be not more than 100,000 per cubic centimeter. Physical examinations of employees coming in contact with the milk should be insisted upon.

A standard should be set for raw milk which is to be pasteurized and this standard should be not more than 500,000 bacteria per cubic centimeter; above this number milk should be deemed unfit for human consumption.

It has been customary in the office to issue permits for the sale of milk without any inspection of the premises. This is a mistake and should be corrected. The milk inspector has also been inspecting stores where milk is sold. This is unnecessary as the inspector employed in inspecting foods can at the same time readily look out for the milk for sale. At present there is a duplication of visits to the same store. The milk inspector can better devote his time to the inspection of the milk at milk depots. To do this properly he

must be provided with sterile paddles and a lactometer and thermometer, as well as sterile sample bottles. An inspection of the contents of a can of milk is far more important than an inspection of the outside of the can.

In the event that such examination of bulk milk shows it to be below standard a sample should be taken for laboratory tests and the milk denatured with rennet and returned to the producer.

Date.	Raw milk.						Pasteurized milk.			
	Number of samples.	Per cent containing 100,000 bacteria or under.	Average per cubic centimeter.	Per cent containing over 100,000 per cubic centimeter.	Average per cubic centimeter.	Average per cubic centimeter (all samples).	Number of samples.	Average count.	Maximum count.	Minimum count.
1912.										
January.....	8	100	44,000			44,000				
February.....	4			100	2,532,222	2,532,222				
March.....	9	34	22,730	66	638,000	232,910				
April.....	24	8	50,000	92	522,954	483,542				
May.....	17			100	671,176	671,176				
June ¹										
July ¹										
August.....	25	24	80,000	76	801,032	628,000	9	542,222	2,000,000	80,000
September.....	23	52	53,000	48	810,909	415,652	5	48,000	80,000	40,000
October.....	22	73	41,176	27	860,000	227,222	14	160,000	580,000	40,000
November.....	24	79	42,165	21	136,000	61,666	4	215,000	400,000	40,000
December.....	22	73	27,000	27	336,666	111,363	2	35,000	60,000	10,000
1913.										
January.....	30	86.6	29,615	13.4	265,000	61,000	2	20,000	20,000	20,000
February.....	25	88	41,363	12	113,333	50,360	3	36,666	80,000	10,000
March.....	29	62	36,666	38	201,818	99,310	3	43,333	100,000	10,000
April.....	24	75	17,100	25	260,000	102,833				
May.....	28	89	19,200	11	383,333	58,214	3	13,333	20,000	10,000
June.....	30	23.4	72,285	76.6	305,652	247,666	2	275,000	300,000	200,000
July.....	23	13	80,000	87	242,500	221,304	1	200,000		
August.....	22	20	50,000	80	233,888	200,455	2	45,000	60,000	30,000
September.....	24	4	80,000	96	225,217	260,833	8	297,500	420,000	100,000
October.....	12			100	447,583	447,583	4	280,000	410,000	30,000
November.....	16	6	60,000	94	328,666	311,875				
December ¹										
1914.										
January ¹										
February ¹										
March ¹										
April ¹										
May.....	10	70	40,000	30	386,666	144,666	2	100,000	180,000	20,000
June ¹										
July ¹										
August ¹										
September.....	23			100	388,260	388,260	2	390,000	400,000	380,000
October.....	29			100	430,345	430,345	7	389,286	460,000	200,000
November.....	20			100	401,000	401,000	4	360,000	400,000	300,000
December.....	16	25	30,000	75	258,333	258,333	8	176,250	300,000	50,000
1915.										
January.....	17			100	495,294	495,294	7	485,714	680,000	380,000

¹ No examinations.

The Inspection of Meats and Other Foods.

Requirements of statute.—Apparently many of the sections of the State food law can be enforced only by the State dairy and food commissioner or his agent. There are, however, three exceptions, namely, those provisions relating to the sale of unlabeled goods in

cans or jars, the sale of falsely stamped cans containing preserved fruit, vegetables or other foods, or mislabeled "soaked" goods, which it is specifically stated must be enforced by the local board of health. Fines are provided for violations in each instance.

A State law also authorizes the local board of health to employ food inspectors and to require permits to sell meat.

A statute also prohibits the cutting of ice from certain places or the sale of impure ice within the municipality. For violations of the sections relating to ice there is provided a fine of not to exceed \$100.

Requirements of ordinances.—City ordinances prohibit the sale of unwholesome food; define the age under which it is unlawful to kill any calf, lamb, or pig; prohibit the slaughter of overheated, diseased, or pregnant animals; provide for the killing and keeping of all animals and the preparation and keeping of all meat, fish, birds, and fowls so that the meat may remain in a good and safe condition for human consumption; prohibit the bringing into the city of damaged grain; prohibit the sale of adulterated or unwholesome food, including milk, and provides that the same may be seized and destroyed and that the owner be liable to fine and imprisonment.

The ordinances further state that it is the duty of persons having the knowledge to report the sale of food unfit for human consumption and that inspectors have the right to condemn and destroy such food or otherwise so dispose of it as to prevent its being used again or exposed for sale.

For a violation of the above ordinances there is provided a fine of not less than \$5 or more than \$50.

Requirements of regulations.—Regulations of the board of health prohibit the transportation of meat in the city unless it be securely wrapped or adequately covered. For violation there is provided a fine of not more than \$100.

Other regulations prohibit the sale of certain foodstuffs unless protected from flies, dust, dirt, or other injurious contaminations, and that no person suffering from a communicable disease may work in a building or part of a building where such foods are sold.

In promulgating these latter regulations the board made the mistake of attaching a penalty clause which conflicted with the State law providing a penalty for violation of any regulations of a local board of health. A number of prosecutions were brought but lost in court for the reason stated.

Methods of procedure.—There are at present three inspectors engaged in the inspection of food products, one inspector whose duty it is to inspect restaurants and one who devotes her time to the inspection of bakeries. As previously stated the dairy and food inspector, a veterinarian, is required to inspect animals before and

after slaughter. His duties, however, are too numerous to permit him to give the necessary time to any one subject.

The local slaughterhouses are just without the city limits. One is under United States Government supervision. All of the slaughterhouses visited personally were in fairly good sanitary condition. Certain nuisances have occurred from the methods of disposal of wastes and odors generated in rendering plants operated in connection with the business, but these have been or are being satisfactorily taken care of by the sanitary engineer of Lucas County.

Restaurants are scored twice a year and the results published in the monthly bulletin and in the daily papers.

A score card for bakeries is now being prepared.

On account of the far greater public health importance of the milk supply as compared to other foods, it would seem advisable to reduce the number of food inspectors to two, utilizing the third as an inspector of producing farms.

It would also seem advisable for the benefit of the food inspectors to assemble and publish all of the local ordinances and regulations and to promulgate and publish with them as regulations of the local board of health certain of the laws now being enforced by the agents of the State dairy and food commissioner as well as certain of the laws governing the sanitation of bakeries or other places where food is prepared, now enforced by the State industrial commission. In this way inspectors of the local board of health would have the same authority as State inspectors.

The Chemical Laboratory.

The chemical laboratory is maintained in conjunction with the diagnostic laboratory, and the criticism already made relative to the location of the latter would apply as well to the former.

Steps have already been taken, however, to secure better quarters and two larger, well-lighted, and well-ventilated rooms are now being equipped for laboratory purposes.

The work of the chemical laboratory consists of the chemical examination of milk and other food products and occasionally water.

Samples of milk are examined three times a week for fat content, solids nonfat, water, and the presence of preservatives. The results are published in the monthly bulletin.

Special attention is paid to the presence of visible dirt. The chemist has an interesting collection of cotton disks showing dirt filtered from the market milk of Toledo. This dirt is made up of manure, flies, insect larvæ, straw, etc. It should be stated, however, that more recently there has been a great improvement in the cleanliness of the milk.

Much work has been done in the laboratory with respect to the examination of cereals containing insect larvæ, the examination of spoiled canned goods, confections, etc.

The laboratory is well equipped with apparatus to perform most of the work that may be necessary in the enforcement of pure-food ordinances or regulations.

PUBLIC HEALTH SOCIAL SERVICE.

The public health activities requiring the services of physicians and nurses are carried on by four different organizations. The child welfare work forms a part of the health department, and the health super-

vision of schools comes under the jurisdiction of the board of education, while some communicable-disease nursing and the anti-tuberculosis work are performed by private philanthropy. Thus there is a division of authority and a lack of cooperation not conducive to economy and efficiency.

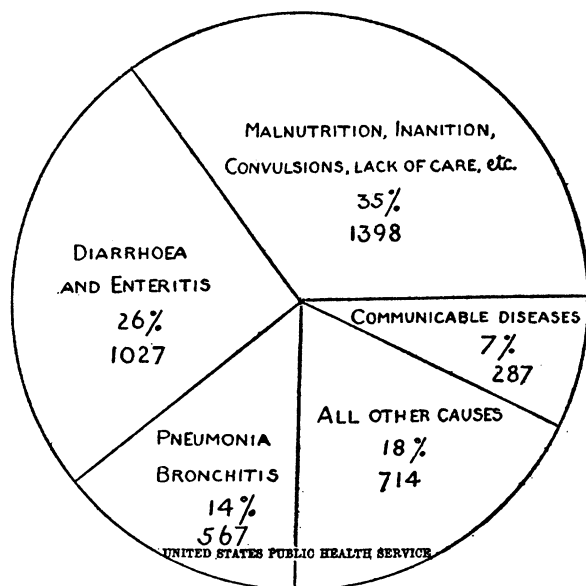


FIG. 6.—Total reported deaths: Infants under 1 year (exclusive of stillbirths), 3,993. Ten years, 1905-1915.

Toledo 3,993 infants under 1 year of age, stillbirths excluded. Of these deaths fully 80 per cent were preventable. (Fig. 6.)

During the year 1914 there were 473 deaths of infants under 1 year of age, exclusive of stillbirths, or 16.27 per cent of the total deaths occurring in the city. The infant death rate for 1914 was 109 per 1,000 births, there having been 4,340 births reported. Of these 473 deaths fully 80 per cent, or the lives of 378 infants, could have been saved.

While a certain amount of infant welfare work has been carried on by the District Nurse Association, the unnecessarily high death rate has made it clear for some time past that a special effort should be attempted to conserve the lives of infants through some organized work on the part of the health department. Accordingly in the

Infant Welfare Work.

During the last 10 years there have died in the city of

1911

June 25, 1915



month of January, 1915, three infant-welfare stations were opened, each in charge of a nurse.

The medical work at the welfare stations is being performed by the medical inspector. It is only recently, however, that milk has been available to furnish the necessary treatment, and it is obtained through private charity.

The city council appropriated \$125 for the purchase of milk for the infant-welfare stations, but the attorney general afterwards ruled that the board of health could not furnish food except for those in quarantine. Food as used in this sense has quite a different significance than when applied to infant welfare work, milk in that case being a remedy, usually the only or at least the most important part of the treatment.

From its inception to April 1, 1915, the child-welfare division has treated 244 patients and the nurses have made 934 visits to the homes, giving nursing care and instructions or making investigations into the worthiness of applicants for relief.

It is the intention to gradually extend the work so that eventually not only will all births reported be followed up but prenatal as well as post-natal supervision will be exercised.

There is a state law regulating the keeping of maternity boarding houses and lying-in hospitals. Among other things it permits the State board of health to license all such places after the application for a license has been approved by the local board of health. The local board is also given the power to inspect any such house or hospital at any time.

Health Supervision of Schools.

This work is under the control of the local board of education and is performed by a small but efficient force consisting of four physicians, one dentist, and five nurses.

The physicians and the dentist are part-time officials. The nurses are employed full time.

The chief medical inspector receives a salary of \$1,200 for a year of 12 months. The medical inspectors receive \$750, the dentist \$500, and 3 nurses \$700 each for a year of 10 months, while the 2 nurses at the open-air schools receive \$900 for 12 months' services.

There are enrolled in the public schools of the city 28,749 pupils, as follows:

Elementary	21, 789
Kindergarten.....	2, 922
High school.....	2, 586
Night school.....	1, 356
Open-air schools.....	96
Total.....	28, 749

This number represents 15.6 per cent of the total population.

There are 383 pupils (not included in the above total) enrolled in the special schools for the deaf, dumb, blind, and mentally deficient. No supervision is exercised over pupils of the high schools unless there is some special case needing attention.

Methods of procedure.—Upon enrollment, a pupil is given a thorough examination to determine defects, physical and mental, and the results are noted on a card. This card forms the permanent medical record of the child through the entire course of instruction and is filed at the school where the pupil may be in attendance.

To avoid confusion the cards for girls and those for boys are differently colored. They contain spaces for the name of pupil, address, school, grade and age as well as spaces to note any change of address, school, age, or grade. In addition the defects which must be especially looked for are tabulated, with corresponding spaces for the notation of the results of examination and the results of treatment on four different occasions, it being thought that four examinations during the school life of a child should be sufficient to obtain satisfactory results.

A defect is noted on the card by means of symbols, "o" meaning that the pupil has been excluded from school, "x" meaning the presence of a defect not of a serious nature, "xx" signifying a defect sufficiently serious to notify the parent that the child should consult a physician, and "xxx" implying that the defect is serious and needs immediate attention. All cards marked with a "xxx" are summarized on a special form or indexed so to speak, so that the cases may be followed up with facility. Little or no further attention is given to pupils with minor defects.

When a child is found suffering from a condition such as pediculosis, scabies, or other communicable disease requiring exclusion, a notice is made out in duplicate. The original is taken to the parent by the pupil with a circular in English or Hebrew, giving a method of treatment. If the child persistently returns to school without having used the remedy, treatment is applied at the school and the child sent home.

When defects require medical attention, a notice to that effect is made in duplicate and the original taken to the parent by the pupil. Accompanying this notice is a blank form to be filled in by the attending physician and returned to the medical inspector, stating what he has found upon examination and what advice he has given to the parents.

The medical examiners upon the completion of the day's work inclose the duplicate of the "exclusion" and "medical examination" notices in an envelope on the outside of which is a summary of the total number of pupils examined, name of school, number excluded and number of notices sent to parents advising them of physical defects needing attention. This is forwarded to the chief medical inspector.

Dental clinic.—The health supervision of schools includes a free dental clinic, which was originally established by the District Nurse Association but has since been taken over by the board of education.

Facilities for administering treatment have been installed in one of the schools and the dental surgeon devotes half of every week day to the work.

When the medical inspector finds a child whose teeth need attention the regular notice is sent to the parent with a card to be filled out and signed by the parent and taken to the dental clinic by the pupil. This is the authority for furnishing the treatment.

The dentist makes the necessary appointment and keeps a complete record of the defects found and the date of and kind of treatment furnished at each sitting.

In addition to dental relief the child is educated in the care of the teeth. An effort is made to have each child procure a toothbrush, and a circular is issued containing instructions for the care of the teeth.

It is estimated that about 80 per cent of the children own tooth brushes. In some cases it might be advisable to furnish them at cost price or free of charge.

Open-air schools.—There are two open-air public schools. One combines the features of a school and a sanatorium, and would be of incalculable value as an adjunct to any educational institution. It was built at a cost of \$13,099 and is used for pupils who show physical signs of tuberculosis in its incipency and a positive von Pirquet reaction. Open cases of tuberculosis are not taken, but, if possible, are sent to a hospital.

The building is comprised of two wings of two stories each, built to secure the maximum amount of fresh air, screened against flies, and protected against inclement weather by storm shutters, which, when wide open, form an unobstructed passage to the outside air on three sides of the wing. The lower floor of each wing is used for open-air classes; the upper floor forms a sleeping porch, one wing being used by the boys and the other by girls. The wings are connected by an inclosed, heated building, which contains separate toilets, tubs, and shower baths for boys and girls, kitchen, dining room, office, lockers, storerooms, etc.

The sleeping porches provide sufficient space for 60 cots and the enrollment in the school is, therefore, limited to 60 pupils. Needless to say, there is always a waiting list. The two open-air classes represent 8 different grades and are in charge of two teachers, and there are on duty night and day a graduate nurse and an assistant.

The unique features of this school are the facilities offered to pupils to remain day and night. In fact, many of the pupils, 35, to be exact, take advantage of this opportunity to sleep in the open air,

going home only for the period between Saturday afternoon and Sunday afternoon. Three meals a day are furnished to all pupils.

Except in the case of pupils who sleep at home and who have bathing facilities at home, every child is given a bath each day.

Careful records are kept of each pupil, including height, weight, chest measurement, temperature, pulse, respiration, with daily variations. A study of these records furnishes some very important data and warrants one in drawing at least one valuable conclusion, namely, that if a course of open-air instruction can produce such marked beneficial effects in the physically defective, its application to all classes of all schools would be equally valuable as a prophylactic measure. At least, it is unfortunate that the advantages of schools of this kind can not be extended to anemic, under-developed children not necessarily tuberculous. The expense to the board of education of maintaining the institution amounted, in 1914, to \$7,143.57.

The expense of furnishing subsistence is borne by the Thalian Society. It is estimated that the daily ration of three meals costs about 18 cents. The Thalian Society also furnishes the night nurse and an assistant. All other expenses incurred are defrayed by the board of education.

The other open-air school will accommodate 20 pupils. The children are given three meals a day, but no child remains over night.

Antituberculosis Activities.

The Thalian Society.—The activities directed toward the prevention of the spread of tuberculosis are carried on by the Thalian Society, which is the antituberculosis society of the city and is supported by funds raised on tag day. In 1914 the sum raised for this purpose was \$15,900, and in 1913 \$14,712.75.

There are seven physicians and five nurses engaged in this work.

There is one dispensary, which is comprised of a waiting room, office, examining rooms, pharmacy, and storerooms. The quarters are rather small for the work done, especially the waiting room, which is used in common by the tuberculous as well as other patients awaiting treatment by the city physician who has a consulting room adjoining. As the office hours are the same the waiting room is at times overcrowded, and it would be wise and only just for the city, which has but recently established its dispensary, to change the hours of consultation so that they would not conflict with those of the society.

Patients are referred to the antituberculosis dispensary by other charitable organizations, practicing physicians, other patients of the society, and the visiting nurses.

At the first visit to the dispensary a complete history of the patient is taken and entered on a special filing card together with the results

of physical and laboratory examinations. Additional forms are added for weight, temperature, change of treatment, or remarks at subsequent visits or examinations.

A careful sociological investigation is made by a visiting nurse for every new patient and the results of this investigation are filed with the patient's medical record.

The four visiting nurses each submit a daily report of visits made to patients' homes and other matters of interest connected with their duties and these reports together with a daily record of patients, old and new, treated at the dispensary are summarized in a ledger which is totaled at the end of the month and furnishes the information required for a monthly report.

To each patient is given an identification card, which is authority for further relief, a circular of information relating to the prevention of the spread of and cure of tuberculosis, a sputum cup, a paper pocket sputum flask, and paper napkins.

To handle the field work the city has been divided into four districts, in each of which is a visiting nurse. There are at present 765 patients on the visiting list, obviously too many for four nurses to supervise properly. An effort is made to visit the more seriously ill at least once or twice every week, but others are usually not seen more than once in every three or four weeks.

The von Pirquet reaction is frequently used as an aid to diagnosis in children under 12 years of age. Subcutaneous injection of Koch's Old Tuberculin for diagnosis is used in older children and in adults. The X ray is used extensively as a means of differential diagnosis in questionable cases.

Because of the limited funds and necessarily small staff the pressure of work will not permit of sufficient time to make sputum examinations. In this the society should be assisted by the diagnostic laboratory of the local health department, but unfortunately that laboratory will have to undergo a thorough reorganization before it will be in a position to lend its cooperation. Arrangements have been made with the State board of health laboratory for the examination of sputum.

When there are vacancies in the hospital for tuberculosis, patients are sent there, preference being given to advanced cases.

The hospital for tuberculosis.—This institution is maintained in connection with the Lucas County Infirmary.

The State law does not permit a county infirmary to accept cases of pulmonary tuberculosis unless in separate buildings. Accordingly there was erected and recently opened a tuberculosis hospital located on the same site as the infirmary. It will accommodate 75 beds and cost about \$65,000 or about \$866 a bed, not including the site.

The hospital consists of a brick administration building containing an office, quarters for nurses and a doctor, a kitchen and a dining

room; a brick building containing two wards, sleeping porches, private rooms, operating and dressing rooms; and two wooden pavilions for incipient cases.

The more one studies pulmonary tuberculosis the more one is convinced that the propagation of the disease is due to a very large extent to intimate contact between the sick and the well and that the prophylactic measures ordinarily taken are futile. Certainly little headway can be made against the spread of the disease until there are adequate hospital accommodations and until the compulsory hospitalization of all open cases at least is practiced.

This seems like an enormous undertaking but could be done if, with some State aid, each city, village, township, and county would provide out of its revenues the necessary facilities for isolation. Thus the expense would be more evenly divided and would not be so great a burden on any community. Let there be less expensive but more commodious buildings and then maintain them in a good state of preservation.

Such hospitals should be located within the centers of population which they serve. A patient should know that by going to the hospital he will still be in close touch with his family and friends, who can without expense or trouble visit him from time to time. The general public should be made to understand that it is not the hospital which spreads disease but that it is the infected person whose movements are unrestricted who is a danger to the community.

Tabulation of activities of the Thalian Society, March, 1914, to March, 1915.

Patients under care Mar. 1, 1914.....	260
Patients received during the year.....	743
Total number of patients cared for during the year.....	1,003
Total number of visits made during the year.....	9,307
Deaths from tuberculosis in Toledo (all forms)	337
Under supervision before death.....	104
Per cent.....	32
Cases registered with the State board of health.....	305
Patients sent to the Lucas County Sanatorium.....	2
As the result of nurses' instructions following fumigation after death:	
Percentage of houses cleaned.....	90
Bedding, etc., destroyed.....	10
Bedding, etc., sterilized.....	75
As the result of nurses' instructions following fumigation after removal:	
Percentage of houses cleaned.....	50
Bedding, etc., destroyed.....	5
Bedding, etc., sterilized.....	70

The Toledo District Nurse Association.

This is an association supported by private philanthropy. The excellent work performed by this organization may be divided into two parts, first, that carried on by the graduate nursing staff, which

cares for the indigent sick and instructs the family as to hygiene and sanitation and how to prevent disease; second, the medical staff which furnishes free dispensary treatment to indigent sick women and children.

On the nursing staff are 1 superintendent and 14 other nurses, 10 of whom are employed in district work, 1 who devotes her time to social service, 1 who is in the eye department and cooperates with the State commission for the blind, and 2 who are engaged in the free dispensary work.

There are 12 physicians on the medical staff all of whom are specialists in the different branches of medicine involved in the treatment of women and children, except obstetrics. Nurses only are furnished in obstetrical cases.

The physicians receive no remuneration. Nurses are paid from \$50 to \$75 per month depending upon the length of service. The superintendent receives \$125 per month. Nurses also receive traveling expenses. The medical relief is furnished at the headquarters of the association, which contains examining rooms, pharmacy, a room in which minor operations are performed, offices, store rooms, etc. One room is equipped with three beds which may be occupied for the day by patients who have undergone minor operations, such as a tonsillectomy. For worthy cases suffering from more serious conditions, medical or surgical, hospital relief is provided.

The district nurses are furnished an office in the district in which they work. This office is supplied with the articles necessary in the discharge of their duties. Such articles include dressings, blankets, bandages, bedpans, ice bags, wheel chairs, and in fact everything that is required in nursing or necessary to make the patient more comfortable. These articles may be either given or loaned to the patient.

While much of the work performed by the association is not, strictly speaking, of a public-health nature, being concerned with the cure rather than the prevention of disease, the services rendered are of such great benefit to humanity that they will always be necessary in the community. However, that part of the work which is concerned with the communicable diseases, typhoid fever especially, should be taken over in large part by the nurses of the communicable-disease division of the health department.

Discussion.

The activities mentioned under the caption "Public health social service" are all more or less intimately related to public-health work, and, with the exception of the general nursing performed by the nurses of the District Nurse Association, should be correlated and placed under the control of the health officer. Such a step would put the entire public-health nursing service on a more economical and efficient

basis and would prevent to a large extent a duplication of visits to the home. Each nurse should have a district small enough to permit her, as far as practicable, to perform all of the duties required of her as a public-health official. Such duties would comprise the prevention of the spread of the communicable diseases, including the antituberculosis work, prenatal and postnatal supervision, the health supervision of schools, and the necessary social service. If all of these activities are eventually taken over by the health department, as they should be, there will be required not less than 30 full-time nurses.

The physicians engaged in the work contemplated above need not be employed on full time, but need only be required to furnish such time as will enable them to hold office hours at the antituberculosis and child-welfare stations and to perform the necessary work at the schools.

THE SANITARY POLICE.

This force is composed of 17 uniformed men, thus comprising more than one-half of the total number of employees of the board of health. They have police powers but no special qualifications for health work, nor has any effort been made to give them any training or to supervise their work.

The sanitary police are in charge of a sergeant who should be in a position to supervise the work of the men under him, but, as a matter of fact, his entire time is taken up in the investigation of the social status of people in quarantine, and where necessary, supplying them with subsistence, etc.

The sanitary policemen are each assigned to a district. The report for 1914 shows that they made 38,681 inspections, or about 10 inspections a day per man, allowing for Sundays and the annual vacation. There is no record of the number of reinspections. There were reported to the health department and an inspection made, or found as the result of an inspection, 11,910 nuisances, against each of which was issued a verbal or a written notice to abate, and according to the annual report all such orders were obeyed.

Included among the nuisances reported upon by the sanitary police one finds mentioned "foul vaults" (940), "full vaults" (1,589), and "catch basins and privy vaults located" (2,181). All such contrivances are foul and a menace to health whether full or only partially full. They should be abolished in compliance with existing State law and city ordinance.

In locating sites for new catch basins and privy vaults the health department is virtually assisting the typhoid bacillus to carry on its warfare. It is unnecessary for the board of health to place itself in this position as the State law provides that "except in cities having a building department or otherwise exercising the power to regulate the

erection of buildings, the board of health may regulate the location, construction and repair of water-closets, privies, cesspools, sinks, plumbing, and drains." It is to be noted that the city of Toledo has a building department. The health department should be interested only in seeing that all houses are made to properly connect to the sewer and that no plans for new buildings are approved unless modern toilet facilities are provided for.

Other items in the above list are "garbage and filth in yard" (2,094), "garbage and filth in alley" (2,068), "garbage and rubbish in street" (142), "houses filthy or damp" (52), "defective sidewalks" (11), "vacant lots filthy" (46), "defective plumbing" (59), "water-closets foul and leaking" (21), "dilapidated privies" (57), "obstructed sewers" (67), etc.

Among the items in the report of inspections of more special interest are "garbage boxes ordered" (3,011), "houses placarded" (2,095), "houses disinfected" (2,260), and "manure boxes ordered repaired or constructed" (835).

It will be noted that much of the work involved in making the above inspections is closely associated with the activities of the garbage and the plumbing divisions, so much so that it would not be out of place to place these divisions, in accordance with the practice in many other cities, under the control of the health department.

The police department should be in a position, through its patrolmen, to cooperate with the health department by noting all violations of the sanitary code and issuing notices to abate nuisances without necessarily calling upon the health department except where expert advice is necessary. The health department, through its chemical laboratory, is frequently called upon by the police department to examine for suspected poisons. All such requests are complied with promptly and without charge. It would be but fair on the part of the police to reciprocate by acting in the capacity of sanitary police. This has been done elsewhere with entire satisfaction and does not require any increase over the regular force.

Health departments should realize that they are not established solely for the purpose of abating nuisances and that they have a far more important duty to perform than the inspection of rubbish heaps.

The health department of Toledo has paid too much attention to trivial things, and has left undone many of the more important matters that count in the prevention of disease.

That the field activities have been practically of no avail is proven by the fact that typhoid fever, tuberculosis, diphtheria, and other communicable diseases continue unreduced.

The services of 11 sanitary police could be dispensed with to advantage. The money thus saved, \$9,900, could be utilized to pay a full-time epidemiologist, a full-time bacteriologist, and seven full-time public-health nurses.

THE HOUSING PROBLEM.

Like many other cities of its size, the housing problem has not as yet reached such proportions that it has become a serious matter, and yet there are isolated cases that need immediate action.

Requirement of laws.—The statutes bearing on the powers of council to pass ordinances to regulate the use of houses for human habitation are summarized as follows:

Authority is given to the city council "to regulate by ordinance, the use, repair and maintenance of buildings used for human habitation, the number of occupants, and the mode and manner of occupancy, for the purpose of insuring the healthful, safe, and sanitary environment of the occupants."

With the same object in view, the council may also "compel the owners of such buildings to alter, reconstruct, or modify them or any room, store, compartment, thereof" and "to prohibit the use or occupancy of such building until all orders have been complied with."

The city council may also provide "for the removal and repair of insecure buildings."

The local board of health, under the provisions of statute, may, after appraisal, destroy any building infected with smallpox or other dangerous communicable disease which can not, in the opinion of the board, be made safe by disinfection. The council is required to recompense the owner to the extent of the estimated value, and in the event that the owner is not satisfied with the amount allowed, he may sue for the value thereof.

Requirements of ordinances.—The local ordinances bearing on the housing problem, which are inadequate to meet the situation, are summarized as follows:

Where a building is unsafe or in danger of being set on fire by reason of some fault in its construction, the inspector of buildings may order that the owner place the building in a safe condition or demolish it. If the danger is immediate, the inspector may cause the necessary work to be done to render the building safe or may tear down and remove it.

A lodging house is defined as a building in which persons are accommodated with sleeping apartments; and includes hotels and apartment houses where cooking is not done in the several apartments.

A tenement house or flat building is defined as a building which, or any portion of which, is occupied or intended to be occupied as a dwelling by more than one family on any floor, living independently of one another and doing their cooking upon the premises.

By a basement or cellar is meant a story, the floor of which is 2 feet or more below the grade of the sidewalk, and the ceiling less than 9 feet above the sidewalk. All stories, the ceilings of which are 9 feet or more above the sidewalk must be considered first stories.

The height of any basement used for dwelling purposes or for sleeping apartments must be not less than 8 feet and the height of the ceiling above the grade must be not less than 4 feet. The basement must be properly drained and ventilated, and each apartment must have a window or windows leading to the outside, with not less than 9 square feet of glass for every 100 square feet of floor area.

To be considered habitable, or to be used as a habitation, a room in any dwelling, lodging, or tenement house hereafter built or in any building hereafter altered to be used as such, must be at least 8 feet in height in the clear. An attic may, however,

average 8 feet. Every such room must have one or more windows of an area of at least 10 per cent as great as that of the room. These windows must open either into the external air or into a room having one or more windows opening into the external air, with an area at least 20 per cent as great as that of said room. The top of at least one window in such room or rooms must be at least 7 feet from the floor and the upper sash must be movable.

The provisions above mentioned relating to the height of stories and window area apply to lodging and tenement houses as well as dwellings.

Livery, boarding, or sale stables, gas houses, gas reservoirs, and paint, oil, or varnish works are prohibited within 200 feet of any residence on either side of the street, in any block in which two-thirds of the buildings are devoted exclusively to residence purposes, unless with the written consent of a majority of the owners of the lots in such block and with the consent of certain of the city officials.

Every barn or stable, arranged for the keeping of more than four horses, four mules, or four cattle, must be provided with an adequate ventilating shaft, and where a public sewer is available, must be provided with a tight floor and drained into the sewer.

Water-closet compartments in lodging houses, factories, work shops, and public buildings must be made waterproof to a height six inches above the floor, except at the door, and all water-closets and urinal compartments must have a window opening to the outer air or into a ventilating shaft which has an area of not less than 10 square feet, where practicable.

The ordinances also provide that in lodging houses there must be one water-closet on each floor for each 15 people, and where there are more than 15 people there must be an additional water-closet for every 15 additional persons or fraction thereof.

The above summary is taken from the building code, which also contains provisions as to foundation, basement, and cellar walls. Such provisions, however, would not necessarily contemplate a rat-proof structure. The building ordinances were in fact not devised especially for the protection of the public health, but for adequate strength and fire protection.

An inspection made of some half dozen 5 and 10 cent lodging or "flop" houses, as they are called, disclosed an inexcusable condition calling for the immediate and serious attention of the authorities. The lack of modern toilet facilities and ventilation, the overcrowding, the filth and general insanitary surroundings proved beyond a doubt the necessity for adequate ordinances and efficient supervision. Not all were equally bad. In one at least a decided effort was made to maintain cleanliness which was particularly noticeable in a small, cheap restaurant operated in connection with the lodging house.

Ordinances are needed giving authority to the health department to vacate and under certain conditions to demolish houses unfit for human habitation.

All lodging houses or tenements should be registered in the health department, and no building should be used or remodeled for such purposes without the previous approval of the department. The amount of air space per individual should be specified; inside sleeping rooms in lodging houses should be prohibited; modern toilets and

bathing facilities should be required to be installed in compartments opening into the outside air and should be properly connected to the sewer; the owner should be required to air the rooms daily, to provide clean bedding at least weekly, to use an insecticide on the beds or bunks frequently, to furnish spittoons, and a proper garbage can and to keep the house and surroundings clean and free from accumulations of garbage and rubbish.

There should also be employed in the health department a capable inspector to enforce all ordinances covering the above requirements.

INDUSTRIAL HYGIENE.

The subject of industrial hygiene is especially interesting in Toledo on account of the importance of the city as an industrial center.

Both the State Board of Health and the Industrial Commission have made some valuable studies on the subject, but neither of these State bodies has sufficient funds nor a force of adequate number to enable it to go into details in the various communities.

Inasmuch as the entire matter is really one of prevention of disease and accidents, its regulation would logically be the function of a bureau of industrial hygiene of a State health department, and every local health department should be sufficiently well organized and equipped to act in the capacity of the local field agent of the State body.

Realizing that this idea is too ideal to be put into effect at this time, the chairman of the Committee on Public Health and Sanitation of the Toledo Commerce Club has devised a plan whereby the club would organize a bureau of industrial hygiene to study and improve conditions in the different places employing industrial workers.

The great benefit accruing to both employer and employee by a wise health supervision in industrial pursuits has been proven over and over again by concerns large enough to maintain health and sanitation divisions. Such a bureau in the Commerce Club would perform similar services for concerns employing a small number of men. The plan if put into execution would be a step in advance and would be of such great value both to the employee and the employer that it is to be hoped that the members of the Commerce Club will give it their heartiest support.

FLIES AND MOSQUITOES.

It is reported that these insects are a great pest during certain times of the year, the flies all through the warm weather, and the mosquitoes after about the middle of June.

On the first of April there was begun a sanitary survey and clean-up campaign carried on by the boy scouts under the auspices of the

Committee on Public Health and Sanitation of the Toledo Commerce Club and with the support of the health department. During the progress of the survey there was distributed educational literature on the housefly and fly swatters were sold. An effort was made to secure the cooperation of the citizens in properly caring for and disposing of manure and garbage.

The ordinances providing for the storage and disposal of manure are inadequate, and such as they are, are not obeyed. They should be amended and brought up to date, and then rigidly enforced. A "fly swatting" campaign can be effective only when at the same time the source of the trouble is attacked. More flies can breed in one improperly kept manure pile in a week than can be swatted in a year.

The present study of health conditions in Toledo will include an investigation of the species of mosquitoes prevalent, their breeding places, and how they can be eradicated. The studies of this subject have been deferred pending the first appearance of mosquitoes.

DISSEMINATION OF INFORMATION.

In addition to the circulars of information relating to the cause and prevention of diphtheria, scarlet fever, and typhoid fever, which are sent to each household from which a case of such disease is reported, the health department publishes a monthly bulletin containing the results of the examinations of milk samples, morbidity reports, and occasionally a short popular article on the subject of the milk or other food supply or the cause and prevention of some prevalent communicable disease. About 1,100 of these bulletins are sent out every month to milk dealers, doctors, health officers, and other interested persons.

The duties of a health department include those educational in nature, and it is highly desirable for such a department to inaugurate series of illustrated popular public health lectures, so that the people may be taught the nature of the work of the department in order to cooperate understandingly, and to be in sympathy with all work attempted.

The Committee on Public Health and Sanitation of the Toledo Commerce Club has established a system whereby they will, upon request, furnish a physician or dentist to give five-minute talks on public-health questions before schools, churches, or other public or private gathering. The idea is excellent, and the demand for the services of the lecturers is increasing every day.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is provided for by State law which is placed for its enforcement in a bureau of vital statistics, a subdivision of the Department of State of Ohio.

Local registrars are appointed by the local board of health from a list of eligibles furnished by the Civil Service Commission.

Toledo forms a primary registration district and the position of local registrar is held by the clerk to the local board of health.

Practically all deaths occurring within the city are reported and great care is taken by the local registrar to secure full and accurate data before transmitting the certificates to the State registrar.

The same care is taken with birth certificates. However, many of the births occurring in the city are not reported, while many are reported only after long delay, all of which means unnecessary work for the registrar and faulty statistical data.

The Supreme Court has rendered a decision to the effect that physicians can not be compelled to fill out the whole of the certificate of birth but only that part which refers to place of birth, address, name, plural births, color or race of mother, and the certification of the attending physician. When the physician refuses to submit a completely filled out certificate, the local registrar secures the additional information himself.

The antagonistic attitude of some practitioners of medicine in regard to submitting re-

ports to a health department is often difficult to understand. Certainly there is something wrong in the system of medical education when men are graduated without having been thoroughly impressed with their obligations as physicians to the community and State.

During the year 1914 there were reported to the local registrar 2,846 deaths, which, with a population of 184,126, would give a death rate of 15.45.

For the same period there were registered 4,340 births, giving a birth rate of 23.57.

During the 10-year period 1905 to 1915 there were reported to the health department 23,459 deaths, fully 50 per cent of which could be classed as preventable (fig. 7).

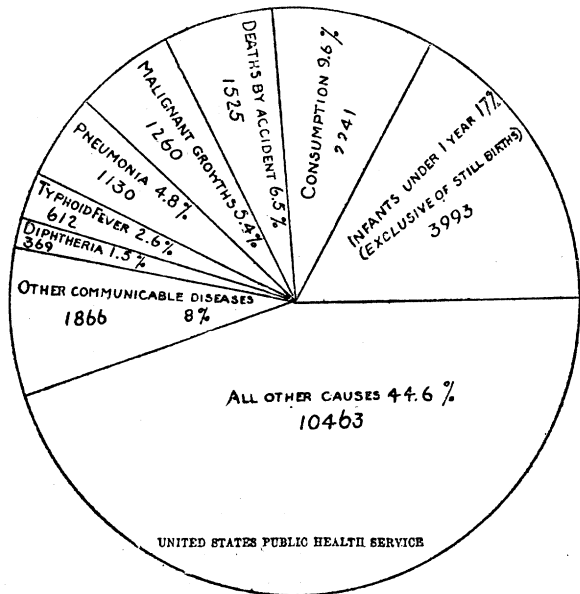


FIG. 7.—Total reported deaths, 23,459. Ten years, 1905-1915.

EXPENDITURES.*Tabulation of expenditures, health department, Toledo, Ohio, calendar year, 1914.*

	Adminis- tration.	Control of disease.	Sanitation.	Educa- tion.	Food in- spection.	Milk in- spection.	Diagnostic laboratory.	Chemical laboratory.	Registra- tion of births and deaths. ¹	Total.
Advertising.....	\$7.07									\$7.07
Automobile and maintenance.....						\$754.10				754.10
Blank and books.....	3.25		\$27.80						\$0.45	31.50
Books and subscriptions.....	15.00									15.00
Chemicals.....		\$4.50	3.75		\$1.25			\$19.98		19.98
Charts and maps.....		\$58.88								58.88
Disinfection and disinfecting apparatus.....							\$0.71			.71
Freight and express.....		21.00						10.75		34.75
Furniture and repairs to furniture.....	1.20						1.00	2.00		4.20
Gas and electricity.....							76.51	1.69		78.20
Laboratory equipment.....							41.68	18.90		60.58
Laboratory supplies.....	5.65	13.67	34.75		43.96			1.00		99.03
Miscellaneous.....	14.40									14.40
Office supplies.....					10.80	43.09				62.89
Paid for food samples.....										
Printing and binding (annual report, bulletins, forms, etc.).....	108.29	112.25	26.50	\$177.50	50.25		3.50	3.50	24.50	506.29
Quarantine (coal and food supplies).....		797.33								797.33
Repairs and alterations.....								2.10		2.10
Salaries.....	2,633.30	2,120.00	13,100.00		3,053.33	2,400.00		1,000.00		24,308.83
Stamps (postage and revenue).....	65.80								2.60	68.40
Stationery.....	30.01									30.01
Telephone and telegraph.....	30.00									30.00
Towels and laundering.....	16.00									16.00
Transportation.....		4.60			111.50	23.00				139.10
Traveling expenses.....				20.00						20.00
Typewriter supplies.....	7.50				12.00					19.50
Uniform regalia (badges, etc.).....		1.59	7.14							8.73
Vaccine.....										1.59
Total ordinary expenses.....	2,937.47	3,936.82	13,199.94	197.50	3,294.29	3,220.19	123.40	1,059.92	27.55	27,997.03

EMERGENCY EXPENDITURES FROM SPECIAL APPROPRIATION ON ACCOUNT OF SMALLPOX.

Physicians (special services).....	\$628.00								\$628.00
Physicians (vaccinators).....	2,437.50								2,437.50
Quarantine wards (for contacts).....	10,012.00								10,012.00
Quarantine food and food furnished to contacts).....	3,593.85								3,593.85
Quarantine (incidental expenses).....	3,692.62								3,692.62
Vaccine.....	793.00								793.00
Total ordinary and extraordinary expenses.....	\$2,937.47	\$13,199.94	\$197.50	\$3,294.29	\$3,220.19	\$123.40	\$1,050.92	\$27.55	46,354.05

¹ The expenses incurred in the collection of vital statistics are borne mainly by the State and the county.

APPROPRIATIONS.

The city of Toledo, like other cities in Ohio, is in a very unfortunate condition financially because of a State law which limits a city's revenues to a 10-mill tax levy to provide for its ordinary maintenance as well as to assume its share in the support of the State and county government.

In addition to this 10-mill tax levy there is allowed a levy of not to exceed 5 mills which goes into a sinking fund to be used for the payment of interest on and the liquidation of bonds issued prior to June 2, 1911, or debts incurred subsequent to that date if incurred by authority of a direct vote of the people. According to a ruling of the supreme court all money borrowed subsequent to June 2, 1911, without such authority from the citizens must be paid out of the 10-mill tax levy.

It is obvious that a restriction such as above placed on a municipality by a State legislature prevents progress. A sufficient amount of money can not be raised to defray the ordinary expenses, and consequently to meet the demands of a growing community money must be borrowed and interest paid. This is expensive and unbusiness-like, for debts must be incurred and left to posterity to settle.

In addition to limiting the amount of taxes that may be levied, a State law has also abolished a certain number of saloons in each community without at the same time increasing the cost of the license for those that remain in business. This has resulted in a loss of revenue to the city of \$85,000 for the first six months of the year 1915.

In apportioning the 10-mill tax levy the State tax of 0.045 mill is first deducted. It is then assumed that the city requires for its ordinary maintenance 5 mills, and for its schools 5 mills, while 3 mills should go to the county. This, however, is a total of 13 mills, or more than is allowed by law, so that instead of 5 mills for ordinary maintenance the city gets but five-thirteenths of the money collected after deducting the State tax, the city schools get five-thirteenths of this amount and the county three-thirteenths. These proportional amounts are not fixed by law, so that it is left to the judgment of the budget commission to make a readjustment if any one of the recipients can get along with less money while others require more.

The tax duplicate for the year 1915 amounts to \$289,881,410. The money collected for the first six months of the year 1915 amounted to \$1,484,567.30. If this sum be doubled it will represent approximately the amount available for the entire year. There is, however, less collected during the last six months as compared to the first six months.

The revenues for the first six months were divided as follows:

To the State.....	\$67,357.00
To the county.....	442,193.05
Schools.....	538,320.22
To the city, ordinary maintenance.....	436,697.03
	<hr/>
	1,484,567.30

The amount received by the city for ordinary maintenance was allotted in the following manner:

Service.....	\$157, 441. 76
Safety.....	205, 364. 27
Health.....	21, 201. 32
University.....	10, 663. 39
Library.....	2, 885. 39
General.....	16, 183. 26
Parks and boulevards.....	19, 445. 00
Hospital purposes.....	3, 512. 64
	<hr/>
	436. 697. 03

For the year 1915 the health department received quite a substantial increase over the year 1914, or approximately \$42,402.64 in 1915, as compared to \$24,840.58 in 1914. This increase has been very helpful, but considering the large organization necessary to adequately handle all of the public health problems more money is needed.

The amount received by the school department is over 55 per cent of the total budget of the city. While this amount is not too much, considering the work done by the public schools, it is mentioned to emphasize the proportionately small amount allowed for public-health purposes.

Likewise for police and fire protection there is allowed 21 per cent of the total revenues available to the city, as compared to 2.2 per cent for the protection of the public health.

The situation which Toledo is in financially is fully appreciated by the writer and might be a reason for reluctance on the part of the budget commission to allow larger funds for health and sanitation. Nevertheless it must be said emphatically that to carry on such work effectually more money is necessary. The minimum amount allowed for such purposes should not be less than 15 per cent of the city's available revenues. This would be for the year 1915, \$292,505 and should be divided so that \$75,000, or 5 per cent, should go to the health department and \$217,505, or 10 per cent, to the department of service for the collection of garbage, the collection of rubbish, street cleaning, and comfort stations. These figures represent an increase of appropriations over the present year of \$32,598 for public health and \$39,685 for sanitation and would be required for maintenance alone.

RECOMMENDATIONS.

As the result of a careful study of public health administration in Toledo extending over a period of over four months, certain definite conclusions have been reached and are made the basis of the following recommendations:

1. That there be created a department of health instead of a division as now provided for by the new charter.

2. That the health officer or director of the department of health be required to devote his full time to his duties; that his tenure of office depend on efficiency, and that he be paid a salary equivalent to that received by other department heads.

3. That for purposes of administration the health department be subdivided into the following divisions: Epidemiology, medical inspection, sanitary inspection, milk and food inspection, birth and death registration, diagnostic laboratory, chemical laboratory.

4. That a full-time epidemiologist be appointed to investigate the origin of each case of communicable disease occurring in the city, especially typhoid fever, scarlet fever, diphtheria, and measles, so that preventive measures may be taken promptly at the source.

5. That a full-time bacteriologist be appointed, and the scope of the work of the laboratory enlarged so that it will be of greater benefit to the health department and to the community.

6. That a thorough study be made of and a better supervision be maintained over the milk supply of the city.

7. That to assist in maintaining this supervision two dairy farm inspectors be appointed by transfer of two men best fitted for the position from the sanitary police force or the food inspectors.

8. That all of the market milk of Toledo be pasteurized before being offered for sale to the public.

9. That in order to prevent the spread of communicable diseases and to better handle the child-welfare work, the present nursing force be immediately increased by seven additional nurses, their duties to include the placarding of houses, the supervision of the prophylactic measures to be taken at the home, and similar measures.

10. That the sanitary police force be reduced to five men, each to have the general duties of a sanitary inspector. In addition to such duties, one, to be known as the chief inspector, to have general supervision over the others and to be held responsible for the efficiency of their work; one, to be known as the tenement-house inspector, to enforce the regulations of the board of health for maintaining the sanitary condition of tenement and lodging houses; and one, to be known as the fumigator, to devote such time as may be necessary to the fumigation of premises that have been occupied by persons suffering from communicable diseases requiring disinfection.

11. That the cooperation of the police force be obtained to investigate nuisances and to issue the necessary orders to abate the same.

12. That the isolation hospital be placed under the control of the health department, and that as soon as practicable a 400-bed hospital, conveniently located, be erected by the city of Toledo for the isolation and care of communicable diseases, with especial reference to open cases of pulmonary tuberculosis.

13. That all catch basins and privy vaults within the city be abolished, and that all premises be made to install flush closets properly connected to the sewer.

14. That all surface wells within the city be eliminated.

15. That water mains and street sewers be extended to all parts of the city as soon as possible.

16. That the plumbing ordinances be so amended that a safe but cheaper system of plumbing be required to be installed wherever necessary.

17. That the council appropriate a sufficient sum of money to defray the expense of installing plumbing in houses where the people can ill afford to pay for it, the expense so incurred by the city to be charged as a lien against the property, to be paid off in easy installments.

18. That the health department furnish disinfectants free of charge to families in which there is a case of typhoid fever.

19. That the health department administer antityphoid vaccine free of charge to those making application.

20. That in the case of diphtheria, cultures be taken from all contacts including pupils of the public or other schools when necessary, and that two negative cultures taken not less than 24 hours apart be required before a patient is released from quarantine.

21. That the collection of garbage be made in the residence portion of the city four times a week in summer and twice a week in winter in addition to the daily collection now being made from hotels and restaurants.

22. That electric or railroad cars be utilized to transport garbage to the reducing plant, in order to save long wagon hauls.

23. That the types of wagons adopted be such that they may be used both for garbage and rubbish.

24. That ashes and other rubbish be collected not less than twice a week and that the material collected be used for filling in low places.

25. That householders be required to keep separate receptacles for garbage and rubbish.

26. That more adequate regulations be promulgated relating to the disposal of stable manure.

27. That the practice of emptying sewage into the creeks be discontinued.

28. That as soon as practicable the antituberculosis work now being performed by the Thalian Society and the health supervision of schools now under the control of the board of education, be taken over by the health department.

29. That to perform these duties, as well as the others of a public health nature required of a health department, the nursing staff be

added to from time to time so that there will eventually be not less than 30 nurses employed.

30. That each nurse be given a district in which she shall perform all of the public health duties required.

31. That the educational work of the health department be extended.

32. That additional automobile transportation be furnished for the use of the dairy farm inspectors and the epidemiologist.

33. That the laws and ordinances relating to public health and the regulations, rules, and instructions of the board of health be assembled and published in booklet form for the information of the employees of the board, so that they may carry on their duties intelligently and understand their authority.

34. That the public health duties imposed by the new charter on the division of charities and corrections be transferred to the department of health.

35. That all citizens of the city cooperate with the health department in its efforts to suppress disease and that physicians make special effort to report promptly all cases of communicable diseases.

36. That special effort be made on the part of the physicians and others to report promptly all births occurring in the city.

37. That the record of expenditures be so kept that the health officer can call at any time for the financial status of any division of his department or piece of work.

38. That 15 per cent of the available revenues of the city be appropriated for purposes of public health and sanitation, \$75,000 for the health department and \$217,505 for the department of service, the latter amount to be used for the collection of garbage, ashes and rubbish, street cleaning, and comfort stations.

It is gratifying to report that the recently appointed health officer has already taken steps to reorganize the health department along the above lines. His efforts to have an efficient organization have been ably supported by the board of health, the newspapers of the city, and those citizens having the best interests of their city at heart.

PLAGUE-PREVENTION WORK.

LOUISIANA—NEW ORLEANS—PLAGUE ERADICATION.

The following report of plague-eradication work at New Orleans for the week ended June 12, 1915, was received from Surg. Creel, of the United States Public Health Service, in temporary charge of the work: